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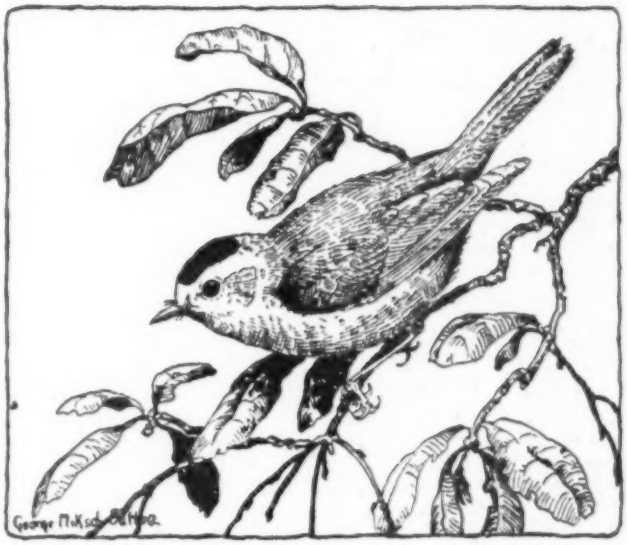
Vol. 54 DECEMBER, 1942 No. 4

The Wilson Bulletin



Published by the

Wilson Ornithological Club

Ann Arbor, Michigan

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THE WILSON BULLETIN

is published quarterly in March, June, September, and December, as the official organ of the Wilson Ornithological Club, at Ann Arbor, Michigan, and is sent to all members not in arrears for dues. The subscription price is $2.00 a year, invariably in advance, in the United States. Single numbers, 50 cents. Outside of the United States the rate is $2.25. Single numbers, 60 cents. Subscriptions should be sent to the Treasurer.

All articles and communications for publication, books and publications for review, exchanges, and claims for lost or undelivered copies of the magazine, should be addressed to the Editor.

The current issue of *The Wilson Bulletin* is printed by the Ann Arbor Press, Ann Arbor, Michigan.

Entered as second class matter July 13, 1916, at Ann Arbor, Michigan, under Act of Congress of March 3, 1879.

THE WILSON ORNITHOLOGICAL CLUB

Founded December 3, 1888. Named after Alexander Wilson, the first American ornithologist, and called the "Father of American Ornithology."

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Figure 1. The male Cedar Waxwing (left) arrives at the nest and gives part of his load of food to the brooding female.

Figure 2. Both birds then feed the four-day old nestlings.

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THE WILSON BULLETIN
A QUARTERLY MAGAZINE OF ORNITHOLOGY
Published by the Wilson Ornithological Club

Vol. 54 DECEMBER, 1942 No. 4

A STUDY OF THE NESTING HABITS OF THE CEDAR WAXWING [1]

BY ROBERT B. LEA

THIS study of the Cedar Waxwing (*Bombycilla cedrorum*) was made in the vicinity of the University of Michigan Biological Station at Douglas Lake, Cheboygan County, Michigan, during the summer sessions of 1940 and 1941. Twenty-one nests were found on the Station grounds in an area 600 yards long and 200 yards wide. The activities at twelve nests were carefully recorded daily, and five of the twelve nests were observed closely from tower blinds placed four feet from the nests.

A summary of the data obtained from these observations is recorded in Table 1, a compilation of information on nest locations, materials, and nest cycle statistics.

This paper is based mainly on the data from Nests 2, 3, and 3a, supplemented by observations on the other nests and by a review of the literature on Waxwings. In addition to 74 hours of observation from blinds, considerable time was spent weighing young and watching activities from the ground.

I am deeply indebted to Olin Sewall Pettingill, Jr., and Theodora Nelson of the University of Michigan Biological Station for the valuable guidance they gave me during this study. And I gratefully acknowledge the helpful suggestions and advice of Mrs. Margaret M. Nice, F. N. Hamerstrom, Jr., and Josselyn Van Tyne in the preparation of the manuscript.

Cedar Waxwings do not ordinarily have a song, though Whittle (1928:82) reported a "distinctly musical and pleasing" song, with a varied warbling arrangement, given frequently by a pet female Cedar Waxwing which was in an indoor cage. The call of the Cedar Waxwing is normally a long drawn out high-pitched lisping and whining sound with little variation through the year. According to Maynard (1928:73) the vocal organs of the Cedar Waxwing are comparatively undeveloped.

The adult birds are relatively quiet during the nesting season. For a call of alarm they use a note louder and higher than their usual call; it is a "piercing danger note, and even that . . . sibilant in quality"

[1] Contribution from the University of Michigan Biological Station.

(Whittle 1928:82; Nice 1941:62). On rare occasions while attending the nest they utter a low rolling sound. The nestlings develop a sibilant lisp as a means of begging food, and after they have left the nest the feeding area becomes a bedlam of Waxwing lisps and whines.

The Cedar Waxwings that I studied did not establish either feeding or breeding territories. Throughout the nesting season I saw small flocks of Waxwings in the Biological Station area. Frequently I saw adult birds from several nests paying no attention to one another while feeding at the same time in the same pin cherry tree and visiting their respective nests at intervals with food for the young. I found families of Waxwings nesting within twenty feet of one another and showing complete toleration of one another's presence. Even when the nestlings were maturing, and moving about in the vicinity, neighboring Waxwings were unconcerned. Wandering individuals or groups of Waxwings which stopped in the nest tree did not seem to make a brooding female uneasy. And a Phoebe that perched within two feet of a nest for fully half a minute aroused no apparent concern in a female Waxwing sitting on the nest.

These findings merely support those of previous observers. A. A. Saunders (1911:323), for example, says that "the flocking habit often continues throughout the nesting period, the nests being placed, if not in actual colonies, at least in close proximity to each other, and the nesting birds often congregating in small flocks." Crouch (1936:6) reported that a pair of Waxwings did not chase away a Chickadee that ventured into their nest and picked around the eggs, though they did fly at a Catbird that approached within two feet of the nest, possibly recognizing the larger species as a natural enemy.

There is evidence, however, that Waxwings may maintain a small nesting territory. A pair under observation while building a nest drove off a Vireo, a Hermit Thrush, and another Cedar Waxwing; and later, with young in the nest, they were disturbed by the presence of a Goldfinch and "flew at it" (Post, 1916:177, 185).

During the courtship period paired Waxwings showed great affection for each other. I watched a pair who engaged in a rhythmic routine of bill-clicking and sidling back and forth on a limb on which they had already begun to build a nest. This is called a "courtship dance" by Silloway (1904:13), who writes: "Two Waxwings were sitting near each other on the lower branch of a fir, about twenty feet from the ground. They were evidently courting. He would sidle over to her, rub his breast against hers, rub his bill caressingly upon hers, and then sidle back to his former place. Then the other bird would go through a similar performance."

Although such courtship displays are usually discontinued with the laying of eggs and the increase in duties about the nest, an activity was observed at Nest 2 which might be considered as a continuance of court-

TABLE 1
RECORDS OF TWELVE CEDAR WAXWING NESTS

Nest No.	Date found	Location	Material	Eggs	Incubation period	Nestlings	Nestling period	Eggs	Young leaving nest	Per cent success
1	6/25/40	Hard Maple A: 3.65 meters B: 1.52 meters	Small sticks, rootlets	5 Waxwing 1 Cowbird	.....	0	.....	5	0	0
2	6/28/40	Hard Maple A: 4.16 meters B: 1.93 meters	String, sticks, grass, rootlets, feathers, leaves	5 Waxwing	(3) 11 days (1) 12 days	4	18 days	5	3	60
3	6/28/40	Red Maple A: 4.64 meters B: 4.11 meters	Grass, rootlets, rag, rope, string, bark, spruce and pine needles, burlap raveling	2 Waxwing 1 Cowbird	11 days	1	17 days	2	1	50
4	6/29/40	Red Oak A: 4.97 meters B: 2.59 meters	White-pine needles, bark sticks, grass	4 Waxwing	?	4	14 days	4	4	100
5	6/29/40	Red Oak A: 2.43 meters B: 2.89 meters		4 Waxwing	?	4	(2) 15 days (2) 17 days	4	4	100
6	7/5/40	Red Maple A: 3.04 meters B: 0 meters	Sticks, grass, pine needles, silky string, moss	4 Waxwing	.....	0	.....	4	0	0
7	6/29/40	Red Maple A: 3.27 meters B: 0 meters		4 Waxwing	.....	3	.....	4	0	0
8	7/17/40	Red Oak A: 2.94 meters B: 2.79 meters		3 Waxwing	.....	0	.....	3	0	0
9	7/19/40	White Birch A: 4.13 meters B: 2.43 meters		?	?	4	.....	?	4	?
10	7/18/40	Hard Maple A: 3.14 meters B: 2.38 meters	Rootlets, sticks, grass	4 Waxwing	12 days	4	15 days	4	4	100
3a	7/7/41	Hard Maple	Grass, paper, leaves, rootlets, sticks, string, plant fibers	5 Waxwing	(2) 11 days (2) 12 days (1) 13 days	5	(3) 14 days (2) 16 days	5	5	100
6a	7/13/41	White Pine A: 7.9 meters	Grass, stems, rootlets, pine needles, thread, paper, leaves, bark	4 Waxwing	12 days	4	.....	4	0	0

Explanation—"A" is the height from the ground; "B", the distance from the trunk of the tree. Numbers in parenthesis under "Incubation period" indicate the number of eggs; those under "Nestling period" the number of nestlings.

ship behavior. When the male finished feeding the female, who was sitting on the nest, the pair engaged in an affectionate routine of bill-clicking and food-passing. The female finally passed the last bit of food to the male; after some billing and mouth-tugging, he returned the morsel. This performance was repeated until the morsel was finally eaten by one of the birds. Lack (1940) has shown that courtship feeding is characteristic of many diverse kinds of birds.

The Cedar Waxwing is a notoriously late nester. The literature shows many records of Waxwings observed nesting late in September, and Herrick (1905:86) reports an instance of a Waxwing found sitting on unhatched eggs as late as mid-October. At the Station the earliest date of eggs of the two seasons was June 15 (inferred); the latest known nest was begun August 1. Though only three nests were found on the first day of their construction, I estimated from the records of 17 nests that the average date of beginning was July 3.

For its nesting area the Waxwing prefers open woodlands where the forest growth gives access to the berry bushes and trees whose fruit is necessary to the feeding of the young. Table 1 lists the locations of the nests and shows that the average height of the nests was 3.63 meters, with the highest nest located 7.9 meters, and the lowest nest 2.43 meters, above the ground.

The Cedar Waxwing's nest is bulky and of loose construction, cup-like in shape, and usually built at the fork of a branch. Its main structure is made up of grass, rootlets, small sticks, and string or paper; the lining, if one is present, usually consists of fine grass, pine needles, or moss. Waxwings use almost any kind of available material in nest building. One nest located near a wastebox was composed mainly of paper packing material, and a nest constructed near a grapevine was made largely of the bark of grape.

In the construction of Nests 3 and 10, male and female toiled equally. The laboring birds left the nest together to search for material and returned to the nest together to share in the building process. Both birds gathered material for Nest 6a, but the female did the greater part of the building. Many observers, like Roberts (1932:160), have found that the main task of nest building was performed by the female, while the male assisted in the collection of material.

Waxwing mates took turns in nest construction work. Alternately each bird stood in the middle of the nest and worked the material into it by stretching the head over the side. The bird thrust the stick or string into place with swift dexterity, and then tucked the material in tightly with choppy actions of the bill. Rocking sidewise, and turning about within the framework, the Waxwing gave the nest the shape of its body.

An interesting episode in the history of Nest 3 occurred when the adult birds selected a diving board mat as a possible source of nesting

material. But a great deal of effort—tugging, violent twisting, and flapping jerks—was required before the strands of burlap were wrested from the mat. Shredding the mat was a tedious job, yet the persistent workers managed to extract fibers as long as 30 inches.

Six days were required for the building of Nest 3 and for Nest 6a. Five days were spent in the construction of Nest 10. These three records of the time required for nest construction are in marked contrast to Herrick's record (1905:94): In two days a pair built a nest, and by six days had four eggs incubating. Ten days later three eggs hatched. This record probably concerns a pair that had lost their first nest very early in the cycle.

On the day following the completion of a nest, the first egg was laid, and an additional egg was usually laid on each succeeding morning until the clutch of four or five eggs was completed. Incubation usually began as soon as the clutch was complete. Table 1 shows that in Nests 2 and 3a, there was as much as two days difference in the time of hatching. Incubation apparently began before the clutch was completed.

Incubation and brooding were done entirely by the female, and the male fed his mate part of the time. The attention of the male during incubation was very irregular. Sometimes he brought food to the female every twenty minutes. At other times he stayed away from the nest over an hour. While feeding, the male could be distinguished from his mate by the heavier black markings on the chin, as mentioned by Crouch (1936:4). By marking one bird with paint William A. Gross (1929:181) found in the case of one nest that both parents were incubating. The impulse of the females to incubate became stronger as the incubation progressed. They left the nest at the slightest disturbance during the first four or five days, but during the last five days the female in Nest 3 remained until my hand almost touched her. Herrick (1935:60) noticed that there is "undoubtedly much individual variation with respect to the reputed timidity of the waxwing, particularly in the early stages of its reproductive cycle."

While resting on the nests the females busied themselves with preening, watching the blind, catching small insects which flew too close, and turning the eggs. They showed distress from the sun's heat by twitching their tails in rhythm with their heavy panting. When they were aware of my presence, they gaped with open mouths and raised crests toward the blind, as though expecting trouble. Their rising crests were always an index of their anxiety.

The average incubation period for 18 marked eggs was 11.7 days; the longest period was thirteen days, and the shortest eleven days. A. A. Saunders (1911:325) gives incubation periods of twelve days in two cases, but William A. Gross (1929:181), who also worked at Douglas Lake, found the incubation period to be fourteen days.

Upon hatching, the young Waxwings were naked and flesh-colored and little longer than the unhatched eggs. They were very weak and able to hold their heads up for only a few seconds at a time. The leg and foot movements were feeble. The young birds did not utter a sound. A few hours after the nestlings hatched, the skin was noticeably darker, and the subdermal feathers along the dorsal tract were evident as tiny blue pimples. A slight jarring of Nest 10 brought the young to attention for food. They were unsteady, and could only with great effort hold up their heads for a few moments as they begged for food.

The nestlings of two days were able to move on their toes but could not definitely grasp objects placed near their feet. They still held up their heads with difficulty even though their body weight was nearly double that of the first day. At this age, whenever the nest was shaded from the sun by my hand, the nestlings responded by reaching for food.

At four days the nestlings moved their wings only in feeble, indirect motions but were able to grasp with their feet. When placed on its back on a board a nestling was unable to right itself, although in the nest it used its ability for directive grasping at the side of the nest to turn itself over. The eye slits of the nestlings at four days were apparently ready to break open.

At the age of seven days the nestlings were able to right themselves from an inverted position on a flat board. The eyes on this day were almost fully opened. The nestlings were quite active and constantly reached about with their feet, as though trying to seize something. One nestling was able to hold aloft a small celluloid ruler which I placed in one foot; it was, however, still unable to support itself upon a perch.

At nine days the nestlings, placed in the blind, used their wings to advantage in crawling about the floor. Bird D showed a great display of strength by perching on my finger and made an important advance by uttering its first sound at this age. It was a lisp similar to the adult call.

After nine days the peace and quiet of the Waxwing nests was gone, with the restless young giving sibilant cries for food and receiving replies from their parents. Furthermore, there was great activity in the nests. The young Waxwings stretched their necks and widely-opened mouths upward as though engaging in a mock feeding exercise, and flapped their wings eagerly as if ready for a take-off. Sometimes the nestlings chewed against the sides of the nest during their preening and stretching. When twelve-day old young were weighed, they all showed great pugnacity by striking my fingers with their bills and lisping belligerently behind their bold, black masks. When I placed them on a limb they clung tightly and were able to pull themselves up to a sitting position when I hung them upside down.

When the young of Nest 2 were twelve days old I placed them on the nest branch several inches from the nest. The adult male, bringing

food at ten minute intervals, attempted to coax them back into the nest by lisping and making short flights from the branch to the nest. The young, heeding his coaxing, became confused in their attempts to descend the branch to the nest, so the parent had to feed them where they were.

Young Cedar Waxwings were very quiet except during feeding periods. Whitman (1919:295) has observed that "except when they may occasionally mistake a passing bird for one of their parents, the young remain discreetly silent while the old birds are away." When conscious of my observation the nestlings of twelve days and older "froze" in rigid positions.

This protective habit has frequently been observed in adults, and Cameron (1908:48) found that Cedar Waxwings "had an extraordinary characteristic, that of drawing themselves to their utmost height and standing perfectly rigid on a branch with closed eyes . . ." Concerning the "freezing" habit Roberts (1932:159-160) remarks that the striped young are thus rendered "more or less invisible" but that the solid-colored adults gain very little by it.

Preening, flapping wings, pecking at each other, and making short flights constituted the activity of the young on the last day before they left the nest.

Until the tenth and eleventh day of their nestling life, the young showed a progressive increase in weight. During the next six days there was a leveling off of the growth curve and then a slight decrease in weight. I raised in captivity one nestling from Nest 3. When it was a month old its body measurements closely approximated those of the adult male.

A mature male, trapped for banding while he was feeding young, weighed 27.9 gms., nearly five grams less than Bird D at the time it left Nest 2, even though the wing spread and body length of the mature bird were greater. According to J. Van Tyne, the weight of this adult bird is less than 38 of the 39 weighed Michigan Cedar Waxwings in the University of Michigan Museum of Zoology collection. Apparently this light weight is to be expected in adult birds feeding young. In male Song Sparrows feeding their young, Nice (1937:26) found a 9 per cent loss of their normal weight; in male Tree Sparrows feeding their young Heydweiller (1935:9) found a 20 per cent loss.

After leaving the nest the young climbed and fluttered about the nest tree, and finally took short flights to neighboring trees. It is my impression that the young remain in the vicinity of the nest for some weeks. I often observed the banded young of Nest 2 feeding in nearby pin cherry trees until they were at least one month old.

The average nestling period for 21 young was 15.5 days. The longest period was 18 days; some of the nestlings left the nest at the age of 14 days. In the case of fourteen-day old fledglings, those in Nest 4

were disturbed by my banding activity, but those in Nest 3a were not disturbed by either banding or weighing and left the nest with their sixteen-day old brothers. In three of the nests observed by A. A. Saunders (1911:327) the young had nestling periods of 14, 16, and 18 days.

The attendance and concern of the female reached a maximum on the last day of incubation and first day of nestling life. From then on her time spent on the nest decreased, while the male, who heretofore had been rather indifferent in his attention to the nest, showed a great burst of activity, and assumed the leading role as food-getter for the young.

Both adults were active in feeding the young. The female made more frequent trips for food, but the male carried greater quantities. When the nestlings were very young and required the attention of the female during the greater part of the day, the male obtained most of the food and brought it to the nest, where the female aided in the feeding activities. When the nestlings required less attention, the female spent more time obtaining food. The female of Nest 3a did a remarkable job in obtaining all of the food for five nestlings when the male failed to appear after the young were ten days old.

TABLE 2

FEEDING FREQUENCY OF FIVE NESTLINGS IN NEST 3A

	Nestlings 1–2 Days	Nestlings 4–5 Days	Nestlings 7–8 Days	Nestlings 11–12 Days
Food supplied by male (trips)...	18	15	25	
Food supplied by female (trips).	8	18	21	41
Total number of feedings.....	26	33	46	41
Average feedings per hour.....	2.1	2.7	3.8	3.4

Table 2 shows the number of feedings required by the five nestlings in Nest 3a at different ages; each figure represents the number of feedings for the thirteen hours between 4:15 A.M. and 5:15 P.M. Up to the time the nestlings were seven days old, each individual was fed at every feeding trip. Later, when the nestlings were older and taking whole berries, I estimated that the average number of young fed per feeding trip was at least 3.5 nestlings. The working day of the adult bird, that is, the period during which nestling-feeding took place, was a little more than fourteen hours. Each young bird was fed on the average from two to three times per hour, or from 28 to 42 times per day.

TABLE 3
ATTENTIVENESS OF FEMALE AT NEST 3A

	Nestlings 1–2 Days	Nestlings 4–5 Days	Nestlings 7–8 Days	Nestlings 11–12 Days
Total hours of attendance.....	10.96 hrs. 87%	6.46 hrs. 59%	4.91 hrs. 38%	2.93 hrs. 25%
Total hours of absence.....	1.56 hrs. 13%	4.46 hrs. 41%	8.05 hrs. 62%	9.08 hrs. 75%

Table 3 shows the attentiveness of the female at the nest in relation to the age of the nestlings. By attentiveness I mean the time spent at the nest, including feeding, as well as the time spent in actual brooding. This information on attentiveness is based on 48 hours of observation at Nest 3a, in four periods of 11 to 13 hours each, during the 1941 season. The table reveals particularly a progressive decrease in female attentiveness as the nestlings grow older. The attentiveness of the female on a given day became less as the heat of the day increased. The male was present irregularly, and only during the short feeding sessions; when the nestlings were eight days old, he was present at the nest 9 per cent of the time during an observation period of 13 hours.

At Nest 3a there was a gradual increase from 2.17 feedings per hour, at the nestling age of two days, to 3.65 feedings per hour at twelve days. As the nestlings increase in age, the frequency of feeding increases, and there are peaks of feeding both in the morning and early afternoon.

The two-day old nestlings in Nest 3a were sheltered without interruption by the female Cedar Waxwing during a severe rainstorm, which lasted an hour and a half. Meanwhile, the male twice succeeded in bringing food and feeding the young while the nest was tossed about by the high wind and rain. During the middle of a very hot day (maximum temperature 93° F.) the feedings ceased, but the female remained at the nest for an hour and forty minutes to shade the five-day old young from the sun. During this time the male did not attempt to bring food.

Generally when males brought food to the nests, they regurgitated indistinguishable masses of fruit and insect material and passed a share of it to the females, who swallowed it. Both sexes then proceeded to regurgitate and to put the food down the gaping mouths of the nestlings. Herrick (1905:92) writes about feeding: "It is all a matter of nervous reaction. The food is not simply placed in the mouth, but pressed well down into the sensitive throat, which promptly responds unless the gullet is already full. The old bird watches the result intently, and if the food is not taken at once it is passed from one to another until a throat with the proper reaction time is found."

At first all food was crushed; but small whole pin cherries were fed to four-day old young, and whole June berries and blueberries were fed

when the nestlings were seven or eight days old. Six June berries comprised the maximum load of food carried by the male.

It is noteworthy that the feeding frequency of the Cedar Waxwing was greatest, not when the young birds were making rapid strides in weight increase, but after the eleventh day, when the activity of the birds was rapidly increasing and the development of the contour feathers was progressing. The food consisted mainly of June berries, pin cherries, blueberries, and various insects and spiders. Of 93 feedings in which the food could be distinguished as it passed to the nestlings, 81 consisted of berries, so that we can assume that about 87 per cent of the food was vegetable matter.

Figure 3. The sanitation of the nest is carried out by both adult birds.

While I was trapping the adult birds of Nest 9 for purposes of banding, I caught three adults that were trying to feed the young Waxwings which were serving as bait in the spring-trap.

Sanitation of the nest was carried out by both adults, since defecation usually occurred after each feeding session. One instance was noted of the persistence of this instinct after the young had left the nest. The male at Nest 2 continued to take the fecal sacs from the twelve-day old

young even though the young were perched on a limb two feet from the nest. Just as if the young birds were in the nest, the parent watched carefully as they posed in a defecating position and swallowed the excrement as it appeared.

Since I found that the Waxwings at the Station made so late a start and since I find no contrary evidence from banded birds, I conclude that, in northern Michigan at least, Waxwings raise but one brood a season. Maynard (1928:76) believes that it is a single-brooded bird, whereas Crouch (1936:7) suggests that as many as three broods are probably raised each season.

The Cowbird parasitized two of the twelve nests. Nest 1 was abandoned for reasons unknown after it was parasitized. Nest 3 was parasitized after two Waxwing eggs had been laid, but on the following day I could not find the Cowbird egg in the vicinity of the nest; I assumed that the Waxwings had removed it. I placed another Cowbird egg in this nest, and it was incubated, though it failed to hatch. Friedmann (1929:234) says that the Waxwing is an uncommon victim of Cowbird parasitism because the Waxwing nesting season starts after the Cowbird laying season has passed its height.

Almost all the birds in the area were compatible with the Cedar Waxwings. The brooding female of Nest 2 paid little attention to the Purple Martins and Kingbirds, which very frequently called overhead, though she did occasionally raise her crest in alarm at their activities. The Red-eyed Vireo, Goldfinch, Least Flycatcher, and Robin were close and peaceable neighbors of the Cedar Waxwings at all of the nests, and at no time was any interspecific strife observed. But Eugene Castle, a student at the Station, saw a Sharp-shinned Hawk make an unsuccessful strike at a group of Cedar Waxwings as they dashed into some low brush in the area.

Of the twelve nests in which activities were recorded daily, seven completed the nesting cycle. There were 44 Waxwing eggs laid in eleven of these nests (data on Nest 9 incomplete), and 29 of them hatched. Twenty-eight young reached the age of five days, and 25 the age of ten. Twenty-one fledglings left these nests, that is, 47.7 per cent of the eggs laid produced fledglings.

Summary

Twenty-one nests were found in an area 600 yards long by 200 yards wide. The activities at twelve nests were recorded.

The nests were found in oak, maple, pine, and birch trees at an average distance of 3.63 meters from the ground and 2.06 meters from the trunk. The nest was a bulky cup-like structure of loose construction.

Six days each were required for building two nests; five days were required for building a third nest.

At two nests both birds shared the nest building activity equally. At a third nest the female was the chief builder.

The average incubation period for eighteen marked eggs was 11.7 days. The maximum period was thirteen days, the minimum eleven. The average clutch was 4.0 eggs.

The nestling stage averaged 15.5 days. The maximum period was eighteen days, and the minimum fourteen.

The female Waxwing did all the incubating and brooding.

As the nestling grew the feeding rate increased, the brooding time decreased, the duties of the male became more important, and the female spent less time at the nest.

The fledglings apparently remained in the vicinity of the nest until they were at least one month old.

Of the 44 eggs laid in eleven nests 47.7 per cent were successful in producing fledglings.

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737 CENTER STREET, ELGIN, ILLINOIS

SHEARWATERS. By R. M. Lockley. J. M. Dent & Sons, Ltd., London, 1942: 5¼ x 8¼ in., xii + 238 pp.; 31 photographs, 4 figs. and 4 maps. 15s. net. Distributed by William Salloch, 344 East 17th St., New York City. $4.00.

Some years ago on a remote island off the Welsh coast, R. M. Lockley turned from farming and shepherding to bird watching and writing. No one since Hudson has, I think, combined the latter activities so satisfactorily and so well. As a professional writer who must keep one eye on the public taste, Lockley exhibits none of the glittering superficiality of Peattie. He has Selous' love of truth and Howard's caution. Writing as easily as Burroughs or Hudson, he is sensitive to character in both birds and men. Still young, and unknown to most Americans, he is a man to watch and an author to read.

The present volume brings together the author's observations on the Manx Shearwater, hitherto scattered in English periodicals. The result is essentially a life-history study, set in a popular framework. Personal in its approach, it lacks the scientific trimmings of full references, graphs and clear summarization. Near the end there is a slight loss in continuity. For the most part, this is an intensive study based on but a few pairs of banded birds. Carried on with increasing penetration over a ten-year period, the observations yielded new and fundamental facts which help to explain the lives of other Procellariiforms—surely one of the more abundant and least known families of birds in the world. The two sexes are found to mate for life; they may relieve each other of incubation duties at periods as long as nine days, and during such intervals they may forage over 500 miles away.

Among the birds studied were Adam and Ada, Bill and Bess, Carol and Caroline. Each had its own personality, but the anthropomorphic twist is never overdone. Youngsters like Hoofti and Toofti lighten the pages. Homing experiments stir one's imagination. The end product is delightful reading and good ornithology.

Attention should be called to the distribution price in America. It is, to say the very least, discouraging.—J. J. Hickey.

INTERRELATIONS IN A NESTING GROUP OF FOUR SPECIES OF BIRDS

BY LAIDLAW WILLIAMS

THIS article concerns the interrelations among pairs of Western Flycatcher (*Empidonax difficilis*), Creeper (*Certhia familiaris*), Bewick's Wren (*Thryomanes bewicki*), and Oregon Junco (*Junco oreganus*) which nested in close proximity to each other in the village of Carmel, Monterey County, California, during the seasons of 1940 and 1941. Not more than one pair of each species was nesting in the area at one time.

As nest sites all the birds used man-made structures. These buildings, located on five contiguous city lots, consist of two one-car garages and an open shed attached to one of them, a small frame house, and a

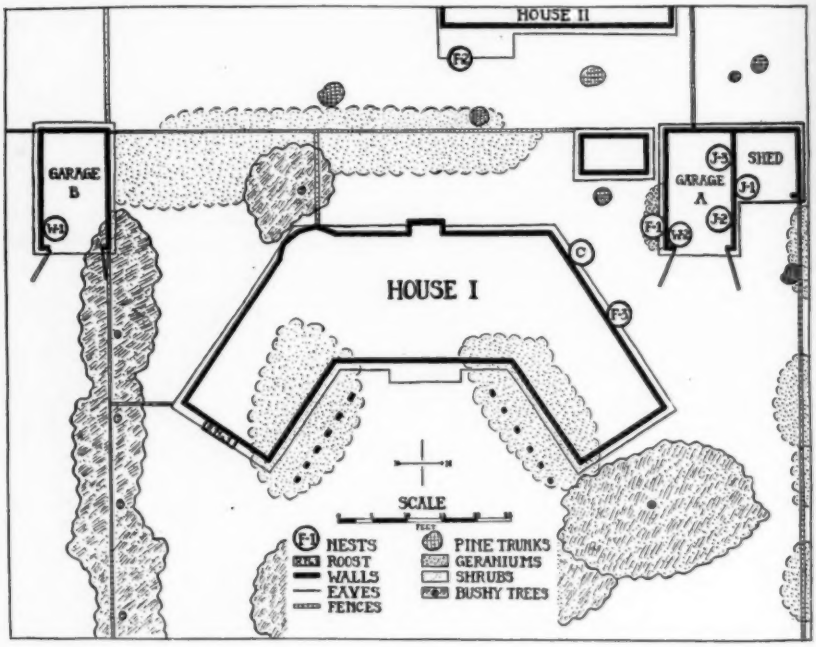

Figure 1. Plan of nest sites.

larger wooden house with walls covered by vertical slabs of redwood bark (Figures 1 and 2). A few Monterey pines, a live oak, a toyon, and a manzanita or two are almost the only relics of the original cover. Most of the native flora has been replaced by exotic trees and shrubs, the

dominant species being genista and acacias. Somewhat less altered conditions prevail on vacant lots nearby. The locality is within the Transition Zone of the humid Pacific Coast District.

Western Flycatcher

Season of 1940.—To make a nesting site for this species a four-inch board was nailed to the rafter ends, about seven feet above the ground, under the south eave of Garage A (Figures 1 and 2). Within a few weeks a pair of flycatchers built a nest (F–1) against a rafter at one end of the board (Figure 3); the young took flight from it on June 2.

Figure 2. Garage A. Nest F-1 was beneath the eave on the left; F-3 was around the corner of House I, on the extreme left. Bewick's Wren and Junco nested on opposite sides of the garage interior. The Creeper nest was on the same face of the house as F-3.

Eleven days later, on June 13, the same nest was being renovated by a flycatcher, presumably one of the same pair. Shredded redwood bark, stripped from the side of House I, was used to build up the sides of the nest, which had been slightly flattened by the first brood. On June 16 an egg was laid, and incubation of a set of three began on June 19. The young hatched on July 4, the fifteenth day of incubation. Five days later they were removed from the nest, presumably by a predator. Bent (1942: 249) remarks that the Western Flycatcher's "period of incubation is said to be 12 days."

Season of 1941.—On May 28 a Western Flycatcher nest (F–3) was found about nine feet above the ground on a horizontal slab of bark over a window of House I (Figure 1). This was probably the second seasonal nest of a pair which had recently fledged young from a nest (F–2) on the porch of House II, about 50 feet away. F–3 was 17½ feet from F–1. The three eggs laid in F–3 were removed on June 3, shortly after incubation had begun, probably by a California Jay *(Aphelocoma californica).*

On July 4 it was observed that nest F–1, which had remained more or less intact on the board beneath the protecting eave since its second use in the preceding season, was again being renovated by a flycatcher.

Figure 3. Western Flycatchers at nest (F-1) built on the end of a board beneath the eave of Garage A. May 29, 1940.

The sides of the nest were rebuilt, and it was used for a second brood as it had been in 1940. The possible renovation of nests of this species for a second brood is indicated by F. M. Bailey (1906), and by Grinnell and Linsdale (1936: 84). Repair and re-use of nests by this species in succeeding years is recorded by Gale (as quoted by Bent).

Creeper

Season of 1940.—On March 23 both members of a pair of Creepers were seen bringing pine needles into a crevice between slabs of redwood

bark on the northwest face of House I. This nest, designated as C, was 15½ feet from the flycatcher nest, F–1 (Figures 1 and 4). A slight widening of the crevice, used as an entrance, was 8¼ feet above the ground. Both parents brought food to the young, which left the nest on May 24.

Bewick's Wren

Season of 1941.—On March 11 a pair of wrens was observed building a nest (W-1) inside Garage B, 80 feet south of Garage A (Figure 2). The nest was placed on the roof plate about eight feet above the ground. The young left this nest on May 3.

Figure 4. Adult Creeper leaving nest crevice (nest C) on the side of House I. May 18, 1940.

Another nest (W–2) containing six eggs, presumably the second set of the same pair, was found on the plate in Garage A on June 6. Five of the six eggs hatched by June 11, but only two of the young were finally fledged. They left the nest on June 28. I do not know what became of the sixth egg nor the other three young. It was noted that spiders were sometimes included in the diet offered by one, or both, of the parents (Figure 5).

Oregon Junco

Season of 1940.—On June 1 a nest (J-1) of this species was being built on a shelf in the open lean-to shed at the north side of Garage A (Figure 1). On June 5 the first of a set of three eggs was laid. On June 19, after two eggs had hatched, the nest was found destroyed, probably by a cat.

Season of 1941.—On June 10 a female junco was seen carrying nesting material into Garage A, where the wrens had nest W–2 which then held six eggs. Large masses of dry grass were brought in on June 11. On June 16 a nest (J–2), containing two eggs to which a third was later added, was found 10½ feet away from Nest W-2 on the roof plate on

Figure 5. Bewick's Wren on the door of Garage A, carrying a spider to feed its young in the nest within the garage. June 15, 1941.

the opposite side of the garage. (A nest of the Carolina Junco [*Junco hyemalis carolinensis*] was found by Sprunt [1930] "placed on the rafter of a garage.") Two young hatched on June 29; they were missing on July 4, probably removed by a jay.

Another nest, J-3, was being constructed on July 8, supposedly by the same pair of juncos. It was on the same plate as J-2 but 7¾ feet farther back in the garage. The first of a set of three eggs was found in it on July 12. The last young hatched between 7 P.M. on July 25 and 5:45 P.M. on July 26. On August 6, at 12:10 P.M., as I was inspecting this nest, I flushed one of two young from it (the third young bird had disappeared some days previously in an unknown manner). The second

bird left the nest, apparently of its own accord, about 15 minutes later. Thus the two young were fledged in not more than 13 days.

Flycatcher: Creeper

On May 24, 1940, when the young flycatchers in F-1 were one week old, the fledgling creepers left nest C. As they took their initial flights they passed close by and lit near F–1; they were attacked in swooping flights by a parent flycatcher, so that one young creeper fell into a thick tangled clump of geraniums beneath the flycatcher nest.

Flycatcher: Junco

On May 30, 1940, antagonism was noted between one of this same flycatcher pair and a junco, probably one of the pair that built J–1. The birds were seen to fight and then fall together into the geraniums. On June 2 the flycatcher swooped and "chattered" at the female junco as she flew from the still empty J-1.

Flycatcher: Wren

On the evening of June 22, 1941, when the young wrens were still in W–2, the male wren was found roosting in the flycatcher nest, F–3, which had been deserted some time previously*. On the night of June 23 the male again roosted in F–3, and the female was found sleeping on the edge of her own nest, not down in the cup—apparently the young entirely filled the cup of W-2. On June 25 the male wren returned to an old roost (Roost No. 1) between redwood slabs on the side of House I (Williams, 1941: 277). The female, however, roosted in another flycatcher nest, F–1, which was just outside the garage wall from her own nest. This nest had remained *in situ* since its last use by the flycatchers in 1940. The female wren continued to roost there on succeeding nights. On the night of June 30, two days after her young had left the nest, she came to F–1 at the usual roosting time with her mate and two young. One of the young clambered onto the nest with her, but presently left, and the female roosted there alone. The male and one of the young roosted in separate chinks at Roost No. 1.

The female's roosting in F–1 continued undisturbed until July 4 when a Western Flycatcher began working fresh material into the sides of the nest. On that evening, as the wren worked her way to the eave directly above the nest, the flycatcher darted at her from a nearby perch, snapping its bill. The wren retaliated by posturing: tail cocked and spread, wings dropped, head held low. Twice again the flycatcher flew at the wren. At one of these encounters the wren fell or flew down out of sight in the geraniums under the nest. About ten minutes later

* In the sleeping posture in the nest the lower back and rump feathers were ruffed out, revealing their subterminal white spots. This ruffing out may be said to be typical of roosting Bewick's Wrens (Williams, 1941). However, in this case, the bird was lying horizontally with tail pointing diagonally upward, whereas the roosting wrens referred to in my 1941 paper generally perched upright with the tail drooping.

the whole wren family, both adults and two young, appeared near F–1. The female wren went to the nest. Twice the flycatcher hovered and snapped its bill in front of the wren on the nest, but the wren remained. The flycatcher flew at one of the young wrens, apparently pecking it, to judge from the ensuing squeal. The flycatcher also drove off the male wren as he approached F–3, 17½ feet from F–1. None the less the female wren was later found roosting in F–1 and persisted in roosting there each night until July 10. The flycatcher laid the first of a set of three eggs in F–1 on July 8. That evening the wren looked down into the nest twice as she settled down to roost. The next night she roosted on two flycatcher eggs, lying well down in the cup of the nest, as the male had at F-3. From outward appearances the wren might have been incubating the flycatcher eggs!

But on the evening of July 10 the flycatcher itself had already started incubation and was on the nest when the wren arrived for roosting. As the wren flew from the eave toward the nest the flycatcher darted off, snapping its bill, and seemed to make contact with the wren, since they both fluttered down into the geraniums together. After the flycatcher had extricated itself it remained nearby and, when the wren crept out of the thicket, attacked again. But almost immediately the wren approached the nest once more, lighting on the side of the garage near it, whereupon the flycatcher attacked, forcing the wren off and, with much loud snapping of bills, they fluttered down into the geraniums again. A squeal was heard, apparently uttered by the wren. Soon the wren moved off, and the flycatcher returned to incubation. I never saw the wren roosting there again.

All three flycatcher eggs hatched, the last between 1 P.M. and 7 P.M. on July 25, making the incubation 15 days, counting from the laying of the last egg until all were hatched. Because the duration of this period corresponds with that of the second brood of 1940, it may be supposed that the sleeping of the female wren on first one, then two, eggs on successive nights in the laying period had no effect on their hatching time. No data was obtained as to whether the wren exposed her abdominal skin to the eggs, nor what the temperature of the eggs was as she slept on them. All three young were fledged and left the nest on August 10 before 11:52 A.M., thus taking their first flight in the sixteenth 24-hour period after the last of them had hatched. Bent (op. cit.) presents no data on the fledging period for this species.

Junco: Wren

The most persistent and aggressively hostile behavior among the birds of this neighborhood of assorted species was exhibited by the pair of juncos that built J–2 and J–3 inside Garage A across from W–2. On June 13, 1941, when five of the wren's eggs had hatched, but before the juncos had begun to lay, the juncos were seen flying at the wrens as

they attempted to bring food to their young. A junco succeeded by these actions in driving a wren away once during an hour of observation in the early afternoon and twice during two hours in the late afternoon. On succeeding days, until the young wrens left the nest, both adult wrens were chased by both juncos. But the wrens managed to bring food to their young in spite of this. After the female junco started incubation, the male did most of the driving, although the female drove upon occasion when she was off the eggs. On June 19, for instance, during an observation period from 11:58 A.M. to 12:41 P.M., the female junco drove a wren upon three occasions while the male drove a wren eight times. The female wren was quicker to return to the garage entrance and more direct in following her route to the young than her mate, who was easily put off by the movements of the juncos and more hesitant in going to the nest. The male wren, holding a load of food in his bill, was actually restrained from delivery for 39 minutes on one occasion, at the end of which period I was forced to leave, the food being still undelivered.

The exact extent of the juncos' territory was never ascertained but I saw them chase the wrens as far as 29 feet northeast and 36 feet east from the garage entrance. The wrens nearly always fled to shrubs and bushy trees. Driving seemed confined to the vicinity of the garage entrance, the only route to the nest used by either pair.

The juncos habitually swooped upon the wrens whenever the latter lit on the ridgepole, the eaves, or the open or closed garage doors (even when closed these doors left a crack at the top large enough for the birds to go through). No actual contact between the birds was ever seen; the wrens always flew away. However, while one wren was being driven from the garage entrance the mate would sometimes dart in from another direction with food for the young.

Retaliation against the juncos was noted only once. On June 28, 1941, the two surviving young wrens of W–2 took flight. When the second one left the nest it fluttered to the ground just outside the garage entrance. The female junco left the nest where she was incubating, flew down to the fledgling wren, and pecked at it. Contact was probably made, as wren feathers, some still partly in sheaths, were found later at the spot. The young wren immediately flew off. At the same moment the male parent wren flew to the ground and advanced close to the female junco. The wren approached the junco slowly, tail spread, wings quivering over the back, while he made a series of snapping sounds, suggestive of the bill-snapping of a flycatcher capturing an insect. The display lasted only a second or two and then both birds flew away.

Often while watching the activities of the two pairs, I noticed that the male junco, while his mate was incubating at the other side of the garage, came up and looked at the nestling wrens. On June 23, six

days before his own young hatched, he put his bill into the open mouth of a young wren. On June 24 and again on June 26 he had a food-like object in his bill before going to the wren nest; but on these occasions, because of the poor light, it was impossible to determine whether the young wrens were actually fed by the junco. On five occasions on June 27, however, I definitely observed the male junco putting food into the mouth of a nestling wren. Feedings by the junco were interspersed with those administered by the parent wrens. On June 28 the male junco was seen removing excreta from the wren nest.

Discussion

Belligerency of the Western Flycatcher toward other species in the vicinity of its nest has been recorded by Richardson (1908: 67), who observed a pair during the process of nest construction. While one bird worked on the nest the other "would place itself in an exposed position to ward off intruders. Evidently it classed all birds as intruders, for an innocent Dusky Warbler, which happened to alight in the tree, was instantly driven off, leaving behind a goodly number of feathers."

The role of "helpers" at the nest, in which another or even several other birds attach themselves to a pair and join in feeding the female and young, has been described briefly by several writers and at some length by Skutch (1935). None of the cases mentioned by the latter, however, involved birds of different species, and the exact status of the helpers was not known beyond the fact that they were most frequently immature birds. There are, however, at least five records in the literature of nesting birds feeding the young of another species in a nearby nest. Hales (1896) tells of a male Scarlet Tanager feeding Chipping Sparrows in their nest before his own young had hatched. Forbush (1929: 420) reports a male Bluebird which, "instead of attending to his own young in a nesting box some thirty feet from the wren-box," attacked the parent wrens and then started feeding the young wrens. A. A. Allen (1930: 224–226) describes the actions of a pair of Redstarts, whose young were being photographed on the hands of Dr. Allen's children. The male readily came and fed his young, but the female was restrained by fear and delivered her food instead to nestling Robins in a nest 25 feet away. Twombley (1934) published a note concerning a Song Sparrow pair with eggs of its own, which fed nestling American Robins, and were first attacked by the Robin parents and then tolerated; the male Song Sparrow continued to feed the young Robins after they had left the nest. Lonsdale (1935) writes of Blue Tits which built a nest inside a nesting box on top of which a pair of English Robins *(Erithacus r. melophilus)* had already built a nest. The Robins laid five eggs and the tits three. When the former eggs hatched, the tits covered their own eggs with feathers and fed the young Robins. At first there was a "bit of a fight but eventually the birds settled

down" and no further friction was noted. After the young Robins left the nest the tits laid another set of seven eggs over the original three and raised a brood.

All five of these cases refer to pairs nesting in close proximity. Three of them refer, as does my own record, to feeding done before the feeder's own young had hatched; the others (the Bluebird and Redstart) had young of their own. In two of these instances the male alone did the foster-feeding, while in the case of the Redstart it was the female. Two of the records describe antagonism exhibited by the true parents toward the foster parents (American and British Robins). The Bluebird, like my Oregon Junco, fed the young wrens even though it attacked the wren parents. Thaxter (1930) describes a "Sacramento spurred towhee" feeding young Sierra Juncos out of the nest and attacking and driving away a female towhee which "would appear on the scene and become interested in the family." But the exact status of the towhees was not given.

E. V. Miller (1941: 92) says that Bewick Wrens do not use posturing as an aid in the maintenance of territory, nor does he record any other instance of posturing by the species. Mrs. Nice (1941), however, records display posturing of *Thryomanes bewickii cryptus* (a male courting a female; a male guarding a nest box) during which wings and tail were spread. In the present study I saw both sexes display, each using a slightly different form.

Nine English Wrens (*Troglodytes t. troglodytes*) have been found roosting together in an old Song Thrush nest (Dunsheath and Doncaster, 1941) and a Mountain Chickadee (*Penthestes gambeli*) has been found roosting in a Robin nest (Bassett, 1923). No antagonism, nor the re-use of these nests by the original owners, was mentioned by these authors.

In the present study, encounters were recorded between the flycatcher and creeper, flycatcher and junco, flycatcher and wren, and junco and wren. In each case the first named was the aggressor. In spite of this interference, all these species had some degree of nesting success.

Further study of interspecific pugnacity might point the way toward a better understanding of much antagonistic behavior among birds. Certainly it would seem that such behavior could not have its origin in sexual rivalry, which has so often been pointed out as a *raison d'être* for territorial behavior. On the one hand, no instance of antagonism was noted by Tinbergen (1939: 13, 28) between Snow Buntings and three other species which live in Snow Bunting territories, except on rare occasions when females apparently mistook Lapland Longspurs for female Snow Buntings. On the other, Mrs. Nice (1937: 68) says that Song Sparrows drive sixteen other species from their territories. "Field Sparrows *(Spizella pusilla)* are driven off with special vigor;

nevertheless, two pairs used regularly to nest on Interpont in the midst of the Song Sparrows." Lack (1936) records pugnacity between pairs of two species of starlings in Tanganyika Territory. Had the aggressor been successful, he writes, no material gain would have been achieved since there was no competition for nesting holes, each of the two pairs nesting in its own cavity four feet from the other in the same dead limb. The *Onychognathus walleri* "were so aggressive that a pair of *Stilbopsar kenricki* were not able to bring material to their own hole." They were aggressive "as a result of the close proximity, not competition, of the *kenricki*. The *kenricki* persisted in building, and eventually toleration was established. The *kenricki* were never observed to retaliate against the *walleri*." The Bewick Wrens, also, were never seen to retaliate against their aggressors except in the two instances of display noted above, and although there was no ceasing of hostilities, the wrens completed their nesting cycle.

Summary

A small community of nesting pairs of four species, Western Flycatcher (*Empidonax difficilis*), Creeper (*Certhia familiaris*), Bewick's Wren (*Thryomanes bewickii*), and Oregon Junco (*Junco oreganus*), is described. All used man-made structures for nest sites.

The walls of a Western Flycatcher's nest were rebuilt for a second brood in the first season, and again rebuilt and used for one brood the following year.

There was antagonism between the nesting pairs, especially between the flycatcher and wren, and junco and wren.

Along with this, however, the male junco fed nestling wrens. Similar behavior in other species is discussed.

Antagonistic display by both male and female wren is recorded, and the circumstances detailed.

Both male and female wren roosted in flycatcher nests.

Other records of interspecific antagonism are discussed, and it is suggested that further study of such behavior might lead to greater understanding of the original causes of territorial behavior.

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BOX 453, CARMEL, CALIFORNIA

WILDLIFE PORTFOLIO OF THE WESTERN PARKS. By Joseph S. Dixon. U. S. Department of Interior. 1942: 8 x 10 in., 121 pp., 58 photos. $1.25 of Supt. of Documents, Washington, D. C.

This attractive book of wildlife photographs was published "as a standard for camera enthusiasts and for the enjoyment of others who simply like to look." The majority of the photographs are by Dixon, but some notable pictures have been contributed by Wendell Chapman, Frank R. Oastler, the Muries, and others. The first 38 photographs are of mammals, 18 others are of birds, and two are of reptiles. The pictures are curiously uneven in quality—a number are first-class, others very mediocre. The author's 35 years' field experience from Alaska to Mexico has in most cases enabled him to handle successfully the difficult task of providing an interesting and worthwhile text for each picture. Scientific names are lacking even in the introductory "List of Animals."—J. Van Tyne.

GENERAL NOTES

Cooper's Hawk Takes Crippled Coot.—On January 15, 1942, I was traveling through the Atchafalaya River Swamp in south-central Louisiana with Conservation Agents Levert Bird and Charles Olana. The purpose of the trip was to collect a few birds that occur in the interior of the southern swamps for the Cooperative Wildlife Research Unit at the Pennsylvania State College.

While we were crossing Lake Natchez in Iberville Parish, a flock of Coots (*Fulica americana*) flew past the boat, and I attempted to collect two of them. The first fell dead in the water not far away, and the second began to topple and fall, badly crippled. When the Coot was thirty or forty feet from the water and about fifty yards from the edge of the lake, a Cooper's Hawk (*Accipiter cooperi*) dashed from its perch in the cypress-tupelo swamp on the lake shore, seized the crippled Coot, and returned to the woods with its prey.

All this happened so quickly that we could not realize for a few seconds what had taken place. By that time, all that could be seen of the potential museum skin was an occasional feather floating down to the surface of the lake.—Russell T. Norris, *Preston Laboratory, Box 847, Butler, Pennsylvania.*

Purple Sandpiper in Indiana.—At about 9 A.M. on December 13, 1941, while unsuccessfully hunting ducks on Lake Wawasee, near Syracuse, Indiana, I saw a Purple Sandpiper (*Arquatella maritima*). No glasses were available, but I observed the bird at my leisure at a distance of about 20 feet. The characteristics observed at the time include: a dark sandpiper with body about as large as a Killdeer, but with shorter tail; bill of moderate length, straight or very slightly decurved; light eye-ring; dark breast and flanks, but light belly; and a definite slate-blue cast to the feathers of the back. In flight, the dark central tail-feathers contrasting with lighter ones on the sides, the dark rump, and the light bar across the wings, were noticed. A sharp drop in temperature during the preceding night had covered most of the shoreward parts of the lake with ice, and frozen the adjacent beaches. But east from Vawter's Park to the point, on the south shore of the lake, there were several hundred feet of open water near shore, and it was on the adjacent beach that the bird was feeding. Though a new bird to me, there seems no doubt of the identification, which I checked a few hours later with Peterson's "Field Guide." It may be observed that almost *any* sandpiper, at that time of year, would be a noteworthy find. According to Mr. Palmer D. Skaar of Indianapolis, this is the first record of the Purple Sandpiper for Indiana.—W. E. Ricker, *Department of Zoology, Indiana University, Bloomington, Indiana.*

Flickers Dusting.—I have seen Flickers (*Colaptes auratus*) of both sexes take dust baths in the beds of flower gardens in suburban Baltimore. A female, already so engaged when first noticed, leaned forward on her breast with ruffled plumage and squirmed from side to side during the few moments more that her dusting lasted. A male squatted in a depression about a foot across and, with plumage expanded, dragged himself about on his belly, clearly by the use of his feet. Several times he dipped forward and dusted his breast, and he also rubbed both cheeks in the shallow dust. His bath lasted some seconds. The dates were, respectively, May 19, 1941, and August 1, 1942.—Hervey Brackbill, *3201 Carlisle Avenue, Baltimore, Maryland.*

Slow Recovery of Ohio Phoebes from the 1940 Storm.—During the early part of 1940 severe storms struck the southeastern states from Texas to Florida. At that time much was written concerning the loss of life of several species of birds but little was reported about the Eastern Phoebe (*Sayornis phoebe*).

In the Toledo area it became apparent in the following spring that Phoebes were greatly reduced in numbers. Whereas in 1939 as many as 20 individuals were seen on a four-hour trip during migration time, in 1940 the maximum was one. This condition continued throughout the breeding season; in fact, I saw but three Phoebes during the entire year.

Having heard much of the rapid recovery made by birds after disasters, I watched this species closely. During 1941 and 1942, however, the increase was very slight, as the following tabulation indicates (the trips were made during the period when the species was present in the Toledo area):

Year	Phoebes seen	Trips made	Phoebes per field trip
1934	115	64	1.8
1935	114	63	1.8
1936	90	60	1.5
1937	87	59	1.5
1938	55	46	1.2
1939	57	48	1.2
1940	3	26	0.1
1941	7	30	0.2
1942	7	34	0.2

The gradual reduction in birds per trip from 1934 to 1939 is probably due to the fact that I became progressively more interested in water birds, and more trips were made to marshes and mud-flats in those years.

Breeding birds were reduced correspondingly. Normally an observer could expect to list a few nesting Phoebes on every field trip into suitable territory. My records show a maximum of six in the course of an afternoon's hike. During 1940 and 1941 I did not encounter a single breeding Phoebe. Inquiries made of other local observers resulted in the following compilation of supposedly nesting Phoebes in Lucas County: 1940 (6); 1941 (7); 1942 (7).

If this condition is widespread, this species must have suffered far greater storm losses than early reports indicated.—Louis W. Campbell, *4531 Walker Avenue, Toledo, Ohio.*

A Technique for Confining Nestling Crows in Food-Habit Studies.—The Crow (*Corvus brachyrhynchos brachyrhynchos*) and its relations to other animals and to agriculture constitute an important part of a farm-game research program in progress at the Rose Lake Wildlife Experiment Station in Clinton County, Michigan. To obtain specimens of the food brought to nestling Crows by the adults, the following technique was evolved.

A number of the Crow nests on the Experiment Station area were found in the spring, and four nests with young were selected for the study. When the nestlings were three to four weeks old they were removed from their nests and confined in cages made from nail kegs. The solid top and bottom of each keg were removed, and the keg sawn in two, crosswise, to make two cages. Each cage was covered on the top with 2-inch mesh chicken wire, and on the bottom with one-inch mesh fox netting. The larger mesh top permitted the confined birds to stick their heads through the openings, to be fed by the adults. The smaller mesh bottom seemed to afford the nestlings a comfortable perch, but did not hinder the food items and droppings from falling through to the ground. Each cage was wired to the base of a tree near the nest at a convenient height. I found that one of the cages less than three feet high was vulnerable to depredation. The birds in this cage were killed and pulled partly through the mesh bottom of the cage

by a mammal, evidently the skunk whose den was within 50 feet of the cage. When the young Crows were about two months old, or after they had been confined for four or five weeks, they became too large and active for their cages and were released. Even at five weeks the adults were still feeding the young regularly.

Pellets and food items were collected from a sheet of heavy wrapping paper spread on the ground beneath the cage. When it rained, the paper, as well as the pellets and food, became wet. This made collecting a little more messy, but did not seem to affect the material, which was thoroughly dried within a few days by exposure to two 500-watt bulbs in a wooden-frame oven. From the four cages 52 collections, totaling 3,225 grams of dried material, were gathered for examination.—PHILIP BAUMGRAS, *Game Division, Michigan Department of Conservation, Lansing, Michigan.*

Swainson's Warbler in Webster County, West Virginia.—From June 13 to 20, 1942, the Brooks Bird Club held its annual field trip at Holly River State Park, Webster County, West Virginia. On the afternoon of the first day I identified there several singing Swainson's Warblers (*Limnothlypis swainsoni*), a species with which I had fortunately had several months' experience in Nicholas County. Subsequently Swainson's Warblers were observed by Mr. and Mrs. John Handlan, Russell West, Mr. and Mrs. Charles Conrad, Pete Chandler, Maxine Thacker, and other members of the club and were found at all suitable habitats visited in the park. This extends about 60 miles northward the known breeding range of the species in West Virginia.—WILLIAM C. LEGG, *Mount Lookout, West Virginia.*

Variable Nesting Habits of the Parula Warbler.—There seems to be a widespread belief among bird students that the breeding distribution of the Parula Warbler (*Compsothlypis americana*) depends strictly on the presence of *Usnea* or *Tillandsia* beard "mosses." R. T. Peterson, for example, in a recent paper (*Audubon Magazine*, 44, 1942: 25) states that "the Parula Warbler is an especially good illustration of association with a particular life form. The northern race is a bird of the cool coniferous forest biome or Canadian life zone. Its ecological niche is where the *Usnea* lichen, or bearded moss, hangs from the trees. The southern race of this bird is found in a totally different biome, the more humid parts of the warm Lower Austral zone. There it is dependent on the Spanish moss" (*Tillandsia*). Clumps of these "mosses" furnish pendant nest sites for the parula warbler.

At Washington, D. C., where neither *Usnea* nor *Tillandsia* is present, Robert S. Bray and I, during May, 1936, found two nests in bunches of dead leaves and debris caught, during a flood earlier that spring, in low branches of deciduous trees bordering the Potomac River. Arthur A. Allen, in June, 1942 (personal letter), examined a similar nest found by Mrs. York along the Chemung River near Elmira, New York; and Florence Merriam Bailey mentioned this type of nest site in her "Handbook of Birds of the Western United States."

A nest collected by Ned Hollister at the National Zoological Park in Washington, D. C., on July 28, 1921 (U.S.N.M. 36282), is composed almost entirely of heavy brown wrapping cord and a small quantity of wool. It is scantily lined with horsehairs and rootlets and, apparently, hung pensile with the opening at the top, vireo-fashion. According to the label, it was found 6 feet, 8 inches from the ground in a Norway spruce (*Picea abies*) on a lawn near buildings. W. Howard Ball in May, 1934, at Washington, D.C., observed a similarly suspended parula nest about 60 feet up, in one of the topmost branches of a sycamore (*Platanus occidentalis*). Its materials could not be determined.

According to E. H. Forbush (Birds of Massachusetts . . . etc., 3, 1929: 227), "Dr. Anne E. Perkins records that about three pairs come yearly to Collins, New

York, and nest in upland woods where no *Usnea* grows. In 1921, one pair was observed building a nest somewhat in the form of that of an oriole on the down hanging branch of a pine tree. The material used was largely skeletonized leaves and pine needles, but the nest was blown down before it was quite finished." Arthur A. Allen at Ithaca, New York, found and photographed (*Bird Lore*, 21, 1919) "a nest composed entirely of leaf skeletons." It was located "at the edge of a small lake, hung in the tip of a drooping hemlock branch about 25 feet above the water. There was no *Usnea* moss in the vicinity, but the substitute had been quite as skillfully used."

J. Warren Jacobs (*Gleanings*, No. 4, 1905: 9) describes two nests that he found at Blacksville, West Virginia, where *Usnea* was scarce. One was "well concealed among the twigs at the end of a drooping spruce branch, nine feet up. The composition was chiefly of fine grasses, with a slight mixture of *Usnea* moss, vegetable fiber and small bits of wool." A second, similarly placed, resembled the first, but "contained a goodly supply of hickory catkins and hair, as well as some fine rootlets in the lining."

Around Washington, Parula Warblers are found in summer in widely varying woodland habitats. Apparently, mature or partly-mature forests are preferred, but open woods composed of trees between 30 and 50 feet tall are often inhabited. Mature pine stands are rare here, but mixed woods and pure deciduous forests seem to be equally occupied. No preference is apparently given either flood plains, hillsides or ridges.

On three large mature and partly-mature woodland areas near the city, the parula population during late June, 1942, averaged about one singing male per 20 acres. My attempts to locate nests in these areas then were fruitless. All individuals observed appeared to be nesting in the crowns of rather isolated 80- to 130-foot forest trees. Two juvenile birds with tails about half grown were observed near the ground on June 28 as they were being fed by their parents, and Robert Bartl of Washington witnessed the feeding of an offspring by an adult male on June 27.—George A. Petrides, *National Park Service, Washington, D. C.*

Myrtle Warbler Feeding Young Cowbird.—On June 30, 1942, Ruth Gilreath and I watched a Myrtle Warbler (*Dendroica coronata*) feeding a young Cowbird (*Molothrus ater*) near Bryant's Bog, Douglas Lake, Cheboygan County, Michigan. The Cowbird was a full grown juvenile, well able to fly. No young Myrtle Warblers were observed in the vicinity.

Friedmann ("The Cowbirds—A Study in Social Parasitism," 1929: 242, 244) describes the Myrtle Warbler as a species very rarely imposed upon, probably because its breeding range overlaps that of the Cowbird in but few places. He gives two records: a nest in Ontario, July 17, 1914 (Harrington, *Oologist*, 32, 1915: 99), containing two eggs far advanced in incubation and one fresh egg of the Cowbird; a nest near Hessel, Mackinac County, Michigan, June 20, 1919 (Van Tyne, *Auk*, 41, 1924: 169), containing a Cowbird egg and a warbler egg.

Friedmann (*Wilson Bulletin*, 46, 1934: 36) later adds another record of a set of one egg of the warbler and 3 eggs of the Cowbird collected at Pittsfield, Maine, May 26, 1891, by C. H. Morrell.—Oscar M. Root, *Brooks School, North Andover, Massachusetts and University of Michigan Biological Station, Cheboygan, Michigan.*

Ornithological Writings of the Late Prof. Frank Smith.—Compiled with the aid of Dr. Harley J. Van Cleave and Miss Alice S. Johnson of the University of Illinois.

1904 An unusual flight of sparrow hawks in Michigan in 1904. *Bull. Mich. Ornith. Club.*, 5(4), December: 77–78.

1906 A plan for a co-operative study of bird migration. *School Science and Mathematics*, 6(3), March: 224–225.

1907 Advantages of migration records in connection with bird study in schools. *School Science and Mathematics*, 7(3), March: 221–224.

1908 A migration flight of purple martins in Michigan in the summer of 1905. *Wilson Bulletin*, 20: 41–43.

1911 Double-crested cormorants breeding in central Illinois. *Auk*, 28(1), Jan., 16–19.

1915 The relation of our shrubs and trees to our wild birds. *Ill. Arbor and Bird Days*, 1915: 7–17, illus.

1915 The value of birds to the gardener and fruit grower. *Trans. Ill. Hort. Soc.*, n.s., 48: 272–77.

1916 (See last title below)

1917 The correlation between the migratory flights of birds and certain accompanying meteorological conditions. *Wilson Bulletin*, 29(1), March: 32–35.

1918 Bird migration and the weather. [*Ill.*] *Audubon Bull.*, 1918, Spring and Summer issue: 15–17.

1918 A snowy owl in captivity. [*Ill.*] *Audubon Bull.*, Spring and Summer issue: 24–25.

1921 Illinois birds as travellers. *Ill. Arbor and Bird Days*, 1921: 21–29, 6 maps.

1922 Starling invaders arrive in Illinois. [*Ill.*] *Audubon Bull*, 1922, Spring issue: 16–17.

1922 The European starling in Illinois. *Trans. Ill. State Acad. Sci.* 15:185.

1925 Interesting results from bird-banding activities. *School Sci. and Math.*, 25(6): 569–573; also in *Trans. Ill. State Acad. Sci.*, 18: 107–112.

1930 Records of spring migration of birds at Urbana, Illinois, 1903–1922. *Bull. Ill. Nat. Hist. Survey*, 19: 105–117.

N. A. Wood, Frank Smith, and Frank C. Gates

1916 The summer birds of the Douglas Lake region, Cheboygan County, Michigan. *Univ. Mich. Mus. Zool. Occ. Papers* No. 27: 1–21.—W. L. McAtee, *Fish and Wildlife Service, Merchandise Mart, Chicago, Illinois.*

New or Uncommon Utah Bird Records.—In a study of bird specimens in the U. S. National Museum collected on some of the early expeditions in the West, I found that a considerable number of the birds taken in September and the early part of October during the Hayden Survey of 1870 were secured on the north rim of the Uinta Mountains, Utah, instead of in Wyoming as had generally been assumed. Among the birds taken are two that are new to the recorded avifauna of Utah. These are:

(1) Myrtle Warbler (*Dendroica coronata*).—U. S. N. M. 60974, collected by H. D. Schmidt, October 9, 1870, near the Green River, south of the mouth of Henrys Fork. It is quite probable that this species occurs occasionally in Utah, at least during migration, but has been confused with its close relative, the Audubon Warbler.

(2) Common Redpoll (*Acanthis l. linaria*).—U. S. N. M. 60970 and 60983, collected October 10, 1870, by H. D. Schmidt in the same locality. This species has been suspected for some time of being a winter visitor to northern Utah, but no additional specimens have been taken. Large flocks have been reported in Bear Lake and Cache valleys near the Idaho-Utah line during the winter, although no specimen or positive record was obtained from the Utah side of the line.

Other uncommon Utah records that have come to my attention are:

(1) Hybrid Flicker (*Colaptes cafer x Colaptes auratus*).—U. S. N. M. 61093, Green River, apparently near Utah-Wyoming boundary, October 13, 1870, Hayden and Schmidt.

(2) Northern Orange-crowned Warbler (*Vermivora c. celata*).—U. S. N. M. 60675, Green River, south of Henrys Fork, October 6, 1870, Hayden and Schmidt; U. S. N. M. 60698, north slope of the Uinta Mountains, September 16, 1870, Hayden and Schmidt; U. S. N. M. 58568, male, Parley's Park, August 16, 1869, Robert Ridgway; Clarence Cottam's No. 1143, male, Raft River Canyon, 7500-foot elevation, in a grove of birches and alders, September 18, 1941.

(3) Northern Yellow Warbler (*Dendroica a. amnicola*).—U. S. N. M. 61871, female, Provo, Utah, July 30, 1872, H. W. Henshaw. (Determination was made by J. W. Aldrich.)

(4) Grinnell's Water-thrush (*Seiurus n. notabilis*).—This bird is probably a regular migrant through Utah. In his field report to the U. S. Biological Survey, Norman D. Betts reported seeing one on May 20 and three on May 22, 1917, at Linwood near the Green River of northeastern Utah.

(5) Harris's Sparrow (*Zonotrichia querula*).—An immature male was found dead November 26, 1916, on Norman D. Betts' ranch house doorstep at Linwood in the northeast corner of the State.—CLARENCE COTTAM, *Fish and Wildlife Service, Chicago, Illinois.*

A Pensile Nest of the Red-wing.—In a recent conversation with my friend, Malcolm W. Rix, of Schenectady, New York, hanging nests of the Red-wing (*Agelaius phoeniceus*) were discussed. Mr. Rix told me that he had found such a nest some years ago and expressed belief that the specimen still existed, perhaps in the attic of his house.

Under date of July 18, 1942, Mr. Rix wrote me that he had been unable to find the nest but enclosed the photograph reproduced herewith. The picture clearly shows the general external appearance of the nest to be much like that of *Icterus spurius* or *Icterus galbula*. It was found May 27, 1900, along Oneida Creek, near Oneida Lake, in Oneida County, New York. It contained four eggs typical of the

species and was at the end of a grape-covered willow branch, about three feet above water several feet deep. The photograph was made by the late Egbert Bagg, Sr., whose son, Egbert Bagg, Jr., was with Mr. Rix when the nest was found.

Mr. Rix informs me that the inside depth of the nest was only slightly greater than that of the general average of the species, and not comparable to that of a Baltimore Oriole's nest. The color of the nest was distinctly that of a Red-wing's, although the materials apparently were somewhat finer than usual.—GEORGE MIKSCH SUTTON, *Cornell University, Ithaca, New York.*

Turkey Bluejoint in the Diet of Indigo Buntings.—Along the northeast shore of Lake Erie, turkey bluejoint (*Andropogon furcatus*) grows abundantly on sand dunes and rocky shores. When found near woody protective growth, the ripe grains of this plant are important in the diet of migrating Indigo Buntings (*Passerina cyanea*). Observations were made at Point Abino in Welland County, Ontario, on the use of this grass by buntings. From August 20 until September 22, 1942, flocks of from 5 to 18 or 20 adult and immature birds were seen daily eating these grains. The birds perched just below the racemes on the two-meter culms, bending them half way to the ground, and then ate the grains on that culm or on an adjacent shorter one. The grains had not yet fallen at this time, and I did not see the buntings feeding on the ground or using any other plant for food. At 9 A. M. on September 17, seventeen buntings were feeding in this manner within an area of about one acre; some were perched in nearby willows in company with Song Sparrows and Chipping Sparrows. However, I did not see these sparrows feeding on bluejoint. When I left Point Abino on September 22, buntings were present in about the same numbers as during the previous few weeks, and bluejoint still formed the major part of their diet.—E. W. JAMESON, JR., *216 Delaware Avenue, Ithaca, New York.*

Additional Notes on Atlantic Coast Sharp-tailed Sparrows.—In my article "The Sharp-tailed Sparrows of the Atlantic Coast," (*Wilson Bulletin*, 54, 1941:107-120) I stated that I did not find Sharp-tailed Sparrows south of Chincoteague Island, Virginia. Dr. Paul Bartsch of the United States National Museum, however, tells me of a nestling *Ammospiza caudacuta diversa* he took at Pea Island, North Carolina, on July 2, 1938. The specimen is now at the United States National Museum. I compared this bird with a nestling from Virginia, and the two are practically identical. Having no knowledge of this specimen at the time I wrote my paper, I believed that it was unlikely that Sharp-tails would be found south of Chincoteague Island. In the light of this evidence one must include North Carolina, as far as Pea Island, in the breeding range of the race. I visited Pea Island in July, 1941, for two days but failed to find traces of these birds. Dr. Bartsch also took a bird, now in his own collection, on Smith Island, Virginia. on July 4. Smith Island is not unlike Cobb and Rogue Islands, where in 1941 I found no evidence of Sharp-tails.

I am not surprised to discover these instances, since the birds are very erratic, and Pea Island offers the proper habitat for Sharp-tails although its neighboring island, Roanoke, does not.

I wish to correct the spelling of "Chebaque," which should read Chebogue, and of "Melassam," which should be Melanson (both on p. 108). These localities I copied directly from Victor Gould's labels, and the two maps I consulted did not list them. "Goss Island" (p. 107) should read Grosse Ile. I am indebted to Harrison F. Lewis for pointing out these errors.—WILLIAM MONTAGNA, *Department of Zoology, Cornell University, Ithaca, New York.*

To the Members of the Wilson Ornithological Club:

Many of you read the statement in the June *Bulletin* regarding the Club's need for additional income. A certain number of members responded, and a good start was made toward a substantial increase in the number of life memberships in the Club. Especially under present conditions, this modest beginning is encouraging. In the March *Bulletin* we shall give you a list of the new Life Members and tell you something about each of them.

At this time the Endowment Committee would like to inform you somewhat more fully on the requirements which must be satisfied if the Club is to fulfill in a satisfactory manner the role it undertakes and the obligations it assumes in the field of ornithology. And we wish to emphasize most strongly that only through your generous assistance, and that of the friends of the Club, can this very desirable end be attained.

Of the various activities of the Club, by far the most important is the publication and distribution of the *Wilson Bulletin,* for it is by means of the *Bulletin* that we make our major contribution to ornithology. Through its pages are presented the most recent observations and researches in the field; its book reviews and notes keep the membership up to date in this and in related fields; and it creates a sense of unity and of satisfaction in the work of the Club. Next to this in importance comes the holding of our annual meeting, and as you know, this event has come to be one of the outstanding meetings of its kind, both because of the uniform excellence of its programs and because of the quality and enthusiasm of its attendance. Still other activities are those of various committees, though in the main they carry on their work with little expenditure of Club funds.

Most of these activities are of an expanding nature, and so outgrow our ability at any time to carry them on to the fullest extent. For example, there is an urgent need for enlarging the *Bulletin* to permit timely publication of important papers that now must wait until space is available. More illustrations and an occasional color-plate would also be highly desirable. The work of scientific committees on worthy research projects should be greatly extended.

All these things call for additional income, and such additional income must be secured through an increase in endowment. The increase in endowment, in turn, will have to come from the following three sources:

Life Memberships: By the payment of one hundred dollars in one sum, or in four annual installments, one may become a Life Member, with exemption from further payment of dues. For those engaged professionally in the field of ornithology, or closely related fields, such payments are deductible from taxable income.

Outright Gifts: Those who wish to support the work of the Club are urged to make direct donations to the Endowment Fund. Such contributions can be ear-marked for specified purposes if desired, but it is preferable to leave the disposition of the income from such gifts to the discretion of the Club's officers and Council. Such gifts to a scientific organization are also deductible from taxable income.

Bequests: We suggest that consideration be given to the matter of contribution to the Endowment Fund through gifts of this nature. An attorney should be consulted on the most effective method of bequest.

The Committee urges your earnest consideration of these matters to the end that you contribute to the extent of your ability to the furtherance of the aims and purposes of the Club. You believe that the Club is doing a fine work in its field, and that it should be enabled to enlarge its contribution; you would like to see the Club maintain its excellent position and go on to further eminence. It is up to you—the Club needs your help!

Respectfully yours,
The Endowment Committee
George B. Thorp, *Chairman*

EDITORIAL

We would welcome a much larger number of contributions to the General Notes section of the *Bulletin*. These notes provide items of especial interest to a wide variety of readers and often contain, page for page, more contribution to ornithology than major articles. However, contrary to the first impressions of many intending contributors, a really good note requires careful thought and accurate writing. Usually several versions are necessary before even the most experienced writer attains an accurate, concise statement of all of the pertinent facts and the justifiable conclusions. As to subject matter, our readers are least interested in records of unusual seasonal or geographical occurrence; reports on habits and other life history matters are much preferred and commonly have more scientific value.

Many of our members are now in the Army, Navy, or Marine Corps, or are doing civilian war-work in regions strange to them. The revised membership list published in this issue will enable them to locate fellow Wilson Club members who live nearby and can direct them to the best places for bird study. In these strenuous times there are more frequent address changes than usual, but your Secretary and Editor will gladly furnish members with the latest such information on any region. On behalf of the British Ornithologists' Club, N. B. Kinnear of the British Museum of Natural History (Cromwell Road, London, S. W. 7) has generously offered similar help to any of our members stationed in that country.

We are indebted for editorial assistance during 1942 to W. J. Breckenridge, Pierce Brodkorb, Frederick M. Gaige, Helen T. Gaige, Grace Orton, Roger T. Peterson, George M. Sutton, Ruth D. Turner, Frank N. Wilson.

Ornithological News

The Sixtieth Annual Meeting of the American Ornithologists' Union was held at the Academy of Natural Sciences in Philadelphia, October 12 to 16, 1942. Officers elected for the new year were as follows: *President,* James L. Peters; *Vice Presidents,* George Willett, and Hoyes Lloyd; *Secretary,* Lawrence E. Hicks; *Treasurer,* J. Fletcher Street; *Editor,* John T. Zimmer. Arthur A. Allen, Rudolphe M. de Schauensee, Robert C. Murphy, and Rudyerd Boulton were elected new members of the Council; Clarence Cottam, Rudolphe M. de Schauensee, and Harrison F. Lewis were elected Fellows; Earle R. Greene, Harry W. Hann, Robert C. Miller, Earle L. Poole, and S. Dillon Ripley were elected new Members. The 1943 meeting, if conditions permit, will be held in New York City in October.

Claude H. B. Grant, editor of *The Ibis,* announces the election of David Lack to the new post of Biological Assistant Editor. With the year 1943, the grouping of annual volumes of *The Ibis* into six-volume series will be discontinued, and the one for that year will be designated as volume 85.

The 1942 Walker Prize in Natural History was awarded by the Boston Society of Natural History to Frank Bene of Springfield, New Jersey, for a paper on hummingbird behavior.

William W. Griffin recently resigned as editor of *The Oriole,* quarterly publication of the Georgia Ornithological Society, to join the Marines. In September he was commissioned second lieutenant. The new editor of *The Oriole* is Robert Norris of Tifton, Georgia.

Richard L. Weaver has been called to the University of New Hampshire at Durham as Extension Specialist in Conservation and Associate Professor of Biology.

William F. Rapp, Jr. (130 Washington Avenue, Chatham, N.J.) is making a study of the occurrence of the Swallow-tailed Kite in the northeastern states (Pennsylvania, Delaware, and northeastward). He requests information on all records and especially on the present location of specimens.

REPORT OF THE NOMINATING COMMITTEE

Your Committee offers the following nominations for officers of the Wilson Ornithological Club for 1943:

President: George Miksch Sutton
First Vice-President: S. Charles Kendeigh
Second Vice-President: Olin Sewall Pettingill, Jr.
Secretary: Maurice G. Brooks
Treasurer: Milton B. Trautman
Councillors: Burt L. Monroe, Eugene P. Odum, Lawrence H. Walkinshaw.

Since the usual Annual Meeting has been cancelled because of war conditions, balloting must be by mail. Therefore this committee report is being published in the December *Wilson Bulletin* and members are requested to mail their votes promptly to the Secretary. In addition to the slate offered above, all Active and Sustaining Members are eligible for office in the Club. Any such name may be written on members' ballots, if preferred, in place of names from your committee's slate.

HERBERT L. STODDARD
JESSE M. SHAVER
MARGARET M. NICE, *Chairman*

To the Editor of The Wilson Bulletin:

Though the author-catalog of the "Bibliography of Birds" was published about three years ago (*Field Mus. Nat. Hist., Zool. Ser.*, 25, parts 1 and 2, 1939), there has been unavoidable delay in the publication of the third and much larger volume, which consists mainly of subject- and finding-indices. Galley proof for subjects as far as "migrations" in the subject index was received over a year ago, also 110 pages of page proof, which include subjects as far as "connective tissue." Occasional requests have been received for information contained in these indices, and I am sympathetic with these efforts.

The finding-index cannot be finally arranged until all of the page proof has been produced. However, all of the items have been written, and they have been sorted for those subjects covered by the page proof received. As a topic may occur in many parts of the subject-index, the finding-index is essential. It is, therefore, not feasible to attempt to locate at this time all of the references dealing with a topic. However, many can be located.

I cannot take the time necessary to search through the manuscript of the subject-index or through the many thousands of slips which bear the finding-index items. However, I am willing to employ and direct a student to do what is feasible in collecting references to topics which may interest correspondents. Such service can probably be obtained for 50 cents an hour, and it should ordinarily not take more than a few hours to do what is feasible on any single topic. This expense would be charged to the correspondent. Care would be taken to avoid impracticable searching. My memory of the location of items would of course help.

R. M. STRONG
Loyola University School of Medicine
706 South Wolcott Avenue, Chicago, Ill.

WILDLIFE CONSERVATION

Effects of the War on Government Wildlife Conservation Agencies

Funds, manpower, equipment, materials, and transportation are essentials which enable wildlife conservation agencies to plan and carry on their various functions. To determine what effect the war is having on wildlife agencies, it is necessary to determine the status of these factors at this time.

Funds: Shortly after the United States became involved in war Congress reduced the appropriations of a number of Federal conservation agencies. The Pittman-Robertson appropriations were cut from the Budget Bureau figure of $2,225,000 to $1,250,000. The result will be fewer wildlife restoration projects, but the full effect will not be felt for another year, since many states have carry-overs from last year, and Pittman-Robertson grants are valid for two years.

Food habits work by the Fish and Wildlife Service has been discontinued because no funds were appropriated for it.

The Soil Conservation Service has had to curtail the work of its biology division because of reduced funds. A number of the biologists have been reclassified as farm-planners: their services are still available to wildlife, but on a much more limited scale than formerly.

The Civilian Conservation Corps received no funds, and liquidation of that agency is well under way. Most of the enrollees are either entering military service or are finding places in industry.

A change of agricultural policy from one of restricting the production of food supplies to one of producing to the utmost has resulted in a curtailment of funds to the Agricultural Adjustment Administration, which had indirectly contributed to wildlife restoration by encouraging the planting of grasses and other soil-saving crops.

It is still too early to report the effects of the war on the finances of State game departments. To date the sale of fishing licenses has been about normal; some states have showed increases, others decreases. Figures are not yet available on the sale of hunting licenses. Some states expect reduced receipts, but on the whole it is expected that the numbers of hunters to take the field this fall will be little less than in the previous year.

Manpower: A majority of the men in active wildlife work are of military age, and many have left and others will leave for military service. Replacements are increasingly difficult to make, for most of the eligible candidates—technically trained men, such as engineers, surveyors, agronomists, and persons familiar with map reading—are in great demand by the Army and Navy, and by defense industries. Semi-skilled and unskilled labor are both attracted by the high wages of industry and so are temporarily lost from wildlife restoration projects.

Michigan and West Virginia are examples of what is happening in all State departments. The Michigan Department of Conservation has already had over a hundred of its employes enter military service. Others have found employment in defense industries, where high wages prevail. West Virginia reports that it has had a one-third turnover in its game warden force, due to men leaving for military service and industrial employment.

Equipment and materials: These items are subject to priority ratings, and many of them are becoming difficult, if not impossible, to obtain for wildlife restoration. After the outbreak of war, the Fish and Wildlife Service adopted a policy of starting no new developments, except to replace a very few buildings which had been destroyed by fire and which were essential for the maintenance of existing facilities.

Dealers' stocks of wire fencing are almost exhausted, but there is a tendency, which will undoubtedly grow as the war progresses, to go back to various kinds of wooden fencing. The limiting factor here will be the labor to cut the timber and build the fences.

Scientific instruments, cameras, and all but the most inferior binoculars, are being channeled to the war agencies.

The manufacture of sporting ammunition ceased June 15, 1942, but the effects of this will not be felt for another year as there were adequate supplies of ammunition on hand for this season. Certain types of new guns can no longer be purchased.

Transportation: Along the Eastern Seaboard, conservation law-enforcement agencies have experienced little difficulty in procuring enough rubber and gasoline to carry on their regular duties. The activities of wildlife research men have been curtailed somewhat, but the immediate result has been beneficial as more intensive work on limited areas is being emphasized. In some western states a few Pittman-Robertson men are using horses for short-distance travel. In the East it is expected that sportsmen will save their gasoline for hunting trips, will "double up" on the use of cars, and will use common carriers wherever possible.

In spite of limitations on personnel- and material-resources, the wildlife profession is presented with one of the biggest opportunities it has ever had. In the past, wildlife has been valued primarily as a means of recreation and only secondarily as a product to be utilized. From now until the war is won wildlife must be considered primarily as a renewable resource to be used in helping to preserve the Nation. Actually, the utilization of wild animal products is as old as man.

It is conservatively estimated that 135 million pounds of wild meat and 300 million pounds of fish are harvested by sportsmen and fishermen each year. If this is used in place of domestically produced meat it will free an equivalent amount to be sent to our fighting forces and to our allies. The total supply of game as food can be increased by not wasting any of it and by not allowing so many cripples to escape to die and rot.

In certain places there exist surpluses of large and small game which have been problems to game administrators. It is possible to devise means of reducing these surpluses and using the animals for food. This will call for real wildlife management.

Rough fishes have been considered by many as akin to pollution, but they have been commonly used as food in foreign countries and by many people in this country. Tightened belts can assist us in changing some of our food habits so that many fish products which formerly went to waste will now be used as food.

Commercial interests along our seacoasts have struck a bonanza in shark liver for vitamins and shark fins for a soup which is esteemed by many. A concern in Missouri has begun the manufacture of poultry- and hog-feeds from rough fishes, and commercial deep sea fishermen are saving livers which they once threw away. Ohio is raising both game and food fishes in its hatchery ponds.

Furs are in greater demand than ever before, both for civilian and military purposes, and ways of increasing the production of certain fur animals have been worked out.

If the time comes when restoration projects have to be further reduced or even eliminated because of inability to obtain equipment, supplies, and manpower, greater emphasis could be placed on the purchase of lands to be developed after the war.

The wildlife profession now faces the double challenge of managing and utilizing this resource to help in winning the war and of planning for the period after the war. Within the past decade of wildlife management we have conducted many experiments and demonstrations. The time has come when management for the utmost production and use should be practiced.—William Johnston Howard.

Conservation Notes from Canada

A pronounced increase in the numbers of Hudsonian Curlew that appear in July and August as southbound transients in Saguenay County, Quebec, on the north shore of the Gulf of St. Lawrence, was reported from that region in 1942 by bird protection officers of the Department of Mines and Resources. Flocks

containing from 100 to 20 birds each were not uncommon, and smaller flocks were numerous. Losses that this species may suffer during its annual sojourn in South America are evidently not so great as to prevent an increase in its population when conditions are favorable for it in North America.

The Arctic Islands Native Game Preserve, in the northern part of the Northwest Territories of Canada, was substantially enlarged on August 4, 1942, by Order in Council of the Dominion Government. The area of land and fresh water included in this addition is 281,392 square miles, which brings the total area of this preserve to 720,497 square miles. The total number of Native Game Preserves in Canada's Northwest Territories is five, and their total area is now 865,389 square miles. The policy under which these preserves are administered provides for hunting and trapping by aborigines and half-breeds only, except that in a small number of cases white men's hunting and trapping rights that existed prior to establishment of a preserve are continued.—Harrison F. Lewis.

Plant Sanctuaries

"The convention [of the Michigan United Conservation Clubs] favored a request made by the Michigan Wildflower Association that it back a proposal to legalize establishment of plant sanctuaries in Michigan, similar in nature to the present hundreds of wildlife sanctuaries. Under the proposal, sanctuaries with a minimum of five acres could be established on action of the Conservation Commission. Hunting in such sanctuaries would not be banned." (*Michigan Conservation,* 11, No. 7, p. 6, July-Aug., 1942)

Minnesota Caribou

A "filler" in the December, 1942, issue of *The Conservation Volunteer* (official bulletin of the Minnesota Conservation Department) reports: "Minnesota's last caribou herd in the Red Lake Game Refuge has been helped considerably by the past few mild winters. Most recent information reveals [that] these animals are at least holding their own. Their numbers are estimated at 15-20, including this year's calf crop." (p. 16)

The rest of the story, however, is not "revealed" in the article. It is this: The Red Lake herd is the last one in the United States, barring a few animals that occasionally drift south from Canada in winter. Early in 1938, when the herd had dwindled to three females, the Federal Government undertook to save it by adding to it a number of animals bought from the Canadian Government. Ten (one of which later died) were live-trapped and shipped to Minnesota—an extremely difficult job. Still more time and effort were devoted to a close study of the augmented herd in order to learn what more needed to be done to ensure their safety. This second phase of the work was continued, under increasing difficulties, until the spring of 1942.

About half of the herd has been kept in a 3200 acre corral. Recently, according to earlier agreement, the project was turned over to the State. This autumn the corral was opened and the caribou released; this same autumn a large block of neighboring land, formerly refuge, was opened to deer hunting. The boundary of the new deer hunting area is no more than five miles from the point of release, and the liberated animals have lost their fear of man.

The implications of these recent developments reach beyond the boundaries of the State: conservationists the Nation over will hold the Minnesota Department of Conservation responsible if a single caribou is lost as a result of this blunder.—F.N.H.

Wildlife Conservation Committee
Frederick N. Hamerstrom, Jr., Chairman

ORNITHOLOGICAL LITERATURE [1]

BIRDS AROUND NEW YORK CITY. By Allan D. Cruickshank, American Museum of Natural History. 1942: 5½ x 8 in., xvii + 489 pp. End maps, and 36 photographs. $1:75.

The New York City region, which includes northern New Jersey, all of Long Island, and the southern part of New York State, is, with the possible exception of the Boston region, the most thoroughly worked area its size in North America. The records, made by hundreds of observers, and spanning a period of nearly a century, constitute a volume of material so great that this book is necessarily a synthesis rather than an analysis. If some of Cruickshank's discussions seem a little too generalized, it must be remembered that it is no longer possible to go into minute detail about a region where such a tremendous volume of data has accumulated. Even rarities eventually become commonplace. For example, when Ludlow Griscom wrote his *Birds of the New York City Region* in 1923 there were two records of the Little Gull; now there are 60! Whereas in 1923 there were three records for the Arkansas Kingbird on Long Island, there are now 63, with the number growing each year. There were but three definite records in the New York City area for the Ring-necked Duck; now there are *hundreds*, and the bird can be found on several ponds on any winter's day in numbers up to 150.

Great changes have taken place in the bird life of the northeast during the last quarter of a century. Speaking about this at the 1942 A. O. U. meeting in Philadelphia, Griscom stated it was his belief that those years have seen a far greater change in the status of many birds than any previous period of the same length. Happily there have been many more increases than declines. The author has ably discussed these changes under each species. Unfortunately, due to space limitations, he was not able to devote a chapter to a summary of these changes. It seems inconceivable that as many changes can take place in our avifauna during the next 20 years as have been evidenced by the past 20.

A total of 405 species and subspecies, including eight birds now extirpated, are included in the volume. In addition, three well-known hybrids are treated, though the various duck hybrids are wisely omitted. I myself have seen wild hybrids of Black-Mallard, Pintail-Gadwall and Gadwall-Mallard in the New York City area. Needless to say, any book of this sort is in a sense out of date as soon as it is published. As an example, on July 5, several weeks after the book came out, I found the nest and eggs of a European Goldfinch, which extended the egg dates, as given by Cruickshank, by over one month.

Although the New York City region has been so disturbed by civilization that it is hard to separate it into ecological units, Cruickshank lists 15 major ecological blocks, such as open ocean (two to ten miles out); (2) ocean (from shore to two miles out); (3) ocean beaches and sand dunes; (4) coastal bayberry; etc. Under each is listed the dominant and sub-dominant birds and their seasonal occurrence. There is a splendid discussion of the ornithological year, giving the approximate groupings and dates of arrival of migrants. The bulk of the book is taken up by an annotated list of birds, with an attempt to portray their approximate distribution, some of the reasons for this distribution—extreme dates, average dates and breeding status. Recognizing that each writer has his own concept of such words as *common, rare* and *casual,* Cruickshank has often indicated how many individuals of a species can be seen by a top-notch observer (such as himself) on a peak day. This has a concrete comparison value. Since not many people enjoy collecting privileges, and it is impossible to use such privileges in many places such as city parks where rare birds turn up, it is fortunate that so many of the rarities have been seen and checked by a number of observers; in these cases there can be no question of authenticity. In cases where a single person saw

[1] For additional reviews see pages 237 and 249.

a rare bird, Cruickshank has had to use his own judgment regarding the reliability of the observer, and he has handled this ticklish problem superbly.

Although there are minor points one might quibble with, such as the omission of a few records that probably did not come to his attention, the dynamic Mr. Cruickshank has written an excellent book which might well become a model for regional publications. The volume is attractively illustrated with 36 full-page reproductions of some of the photographs for which the author has become justly famous.—ROGER T. PETERSON.

BIRDS OF NORTH CAROLINA. By T. G. Pearson, C. S. Brimley, and H. H. Brimley. North Carolina Department of Agriculture, State Museum, Raleigh, N. C., 1942: 6⅜ x 9¼ in., xxxii+416 pp., 18 plain and 17 colored pls., 141 text figs. $3.50.

In 1919 Pearson and the Brimleys published their excellent book on North Carolina birds, the first comprehensive study of the birds of that region. Now, after 23 years, they have brought out an enlarged and completely revised book which includes 396 forms, 54 more than in the first edition.

One of the most noticeable improvements is in the illustrations. Some of the worst pictures—and they were sometimes very bad—have been replaced by new drawings by Roger Tory Peterson. In addition, Peterson and the publishers of his famous "Field Guide" have contributed the use of several of his full-page plates (four in color), figuring a large number of species. These plates are printed here with broad margins and therefore appear surprisingly larger than in the "Field Guide." The reproduction of the Peterson color plates is not as good here as in the original, but the loss is not serious. More of the poor color plates from the 1919 edition might better have been discarded since they only duplicate Peterson's much superior pictures of the same species. The majority of the text figures are still the Brasher drawings from the 1919 edition, often characterized by strange, oval eyes—and in some cases quite unidentifiable except for the accompanying legend (for example, three *Hylocichla* thrushes, the Bluebird, and the Phoebe).

We wish the authors had given us more on the habits of birds as observed in North Carolina in place of the many accounts, some not very pertinent, of the senior author's observations in distant places. Strangely, there is no general discussion of bird distribution in North Carolina, and far too many records are unnecessarily vague, with no mention of any locality more exact than the county.

Although North Carolina's ornithological history is a long one—the authors have carried it back to 1584—the true status of many species is still very little known. Clearly there is needed much more field work backed by thorough and discriminating collecting.

Some of the life-history information is sadly out of date. For example, we find quoted Chapman's 1907 statement that only one nest of the Connecticut Warbler has ever been found. It is disappointing, too, to read in a modern book about the "social outcast" Cowbird whose young are "selfish." The implication (p. 171) that any gull insists on unpolluted drinking water is too absurd to mislead any amateur, however untutored.

We suppose that the three full-page portraits of the authors were insisted upon by their enthusiastic friends.

The bibliography seems fairly complete and even includes some 1942 titles. Unfortunately volume numbers are given in the out-dated and easily mis-read roman numerals even when the original was written in arabic numerals. In view of the presence of 1942 titles in the bibliography it is surprising to note that earlier important papers like those of Wallace on the Gray-cheeked Thrushes (1939) and Griscom on the crossbills (1937) have been ignored.

In spite of the several minor faults, which this reviewer has probably overemphasized, this book is an important contribution to ornithology and will do much to stimulate and guide further work in North Carolina and nearby states.—J. Van Tyne.

FADING TRAILS: THE STORY OF ENDANGERED AMERICAN WILDLIFE. By Daniel B. Beard, Frederick C. Lincoln, Victor H. Cahalane, Hartley H. T. Jackson, Ben H. Thompson. MacMillan, N. Y. 1942: 5½ x 8⅜ in., xv + 279 pp., 20 pls. (4 in color), 16 line drawings. $3.00.

In barest outline, the thesis of "Fading Trails" is this: "The arrival of a large number of well-armed and well-equipped white men on the continent of North America caused the greatest natural disturbance since the Ice Age. Man's imprint was made much more quickly than that made by the slow and tedious pace of a changing earth. Within the short space of some three hundred years, the rich wildlife resources had been reduced to a remnant of their former abundance and some species were gone forever. Many other species which became endangered in those years are today still on the verge of extinction, and are yet to be permanently saved" (p. viii) . . . "But most of the waste and greed and useless slaughter is in the past. Species have been rescued and saved" (p. 264).

The details of this sequence have been built up in a thoroughly interesting, and equally scholarly, way. An account of the early abundance of wildlife leads to brief discussions of its exploitation by market hunters (including commercial fisheries and whaling), poachers and game-hogs, and collectors, and of the effects of environmental change—"Human machinery, tearing away at the earth, disturbs conditions which nature has been countless centuries in creating. The reclamation of marshland for agriculture, the plowing up of prairie to plant corn, the dumping of sewage into clean rivers—such artificial conditions have within three centuries done more to decrease the numbers of American wildlife than the half-million years required by nature to deplete a species" (p. 11). The body of the book relates these causes to the animals which are now in gravest danger of extinction: the Bighorn, Woodland Caribou, Sea Otter and other rare fur-bearers, Manatee, Wolf, Mountain Lion, California Condor, Nene, Trumpeter Swan, Pinnated Grouse, Hudsonian Godwit, Everglade Swallow-tailed and White-tailed Kites, Florida Crane, Roseate Spoonbill, Whooper, Ivory-billed Woodpecker, Puerto Rican Parrot, Great Lakes Whitefish, Atlantic Salmon, Lobster, Green Turtle, and American Crocodile. A final chapter treats of an even longer list of animals (many of which, however, are geographic races) which are "close to the shadows." The final word is one of optimism: "Wildlife long ago stood at the crossroads. Today, in spite of scattered examples, it is definitely on the trail to recovery" (p. 264). To some, this may sound a bit over-optimistic.

The foreword warns the reader not to expect "natural history stories"; despite this, the book is fairly crammed with first-rate natural history and ecology.

Walter Weber's striking illustrations add a great deal to the interest of the book, but I must confess that I am not familiar enough with most of the subjects to judge the illustrations fairly.

The conservation movement has snowballed during the last ten or fifteen years, but there has been a too-general belief that it is primarily, or even wholly, a job for Government bureaus. It is a good sign that this book, written by "Bureau" men, lays the final responsibility on the public: the public must decide that the job shall be done and, once the ground-work of fact, land purchase (where needed), and regulation, has been laid, the individual must curb his trigger-itch and give the remnant populations a chance to build up again.—Frederick N. Hamerstrom, Jr.

CUCKOO PROBLEMS. By E. C. Stuart Baker. H. F. and G. Witherby, London, 1942: 5½ x 8½ in., xvi + 207 pp., 12 plates, eight colored. 25 s.

This book is the result of a life-long study of the cuckoo, first from the standpoint of an oologist and secondly from that of a field ornithologist. The author has in his collection nearly 6,000 cuckoo eggs, 1,500 of which are from Europe, 3,000 from Asia and the remainder from other parts of the world. Many of these eggs were collected by himself or by men under his direction, and others were

added by securing the collections of other people. He has traveled much and has spent many years in India, where he gained first-hand knowledge of native species. The seven appendices at the end of the book, covering twenty-seven pages, give a quantity of tabulated information concerning the collection, which includes eggs of thirty-eight species and subspecies of cuckoos, distributed among nine genera. Twelve of the forms fall under the genus *Cuculus*, and six are subspecies of *Cuculus canorus*, the species common in England and continental Europe. The eight colored-plates show eggs of various cuckoos and of their respective hosts.

The problems discussed are largely old ones. He shows that in western Europe the eggs of different races or gens of *Cuculus c. canorus* variously resemble those of their usual hosts, the Reed Warbler, Meadow Pipit, and Pied Wagtail, and that in west-central and western Europe, the eggs of another race resemble those of its host, the Garden Warbler. In Hungary ninety per cent of the cuckoo's eggs are laid in the nest of the Great Reed Warbler, whose eggs they closely resemble, and so on. The author explains in a plausible way how he thinks evolution has brought about this similarity of eggs, through the hosts' desertion of the nests or rejection of the cuckoo's eggs, when these eggs showed too strong a contrast to its own in color or size. The greater the contrast, he believes, the stronger is the host's tendency to destroy the eggs. His argument for a "need" of such evolution or adaptation, however, is not at all convincing.

He describes two methods of laying—direct laying and the projection of eggs into the nest by pressing the cloaca against the opening—but thinks there must be a third, since in some instances it is difficult to see how either of these first two methods could have been used. He makes the time-worn suggestion that the egg is placed in the nest by picking it up in the beak, and for proof he repeats a number of current stories, which, however, fail to prove the point.

To distinguish a cuckoo's eggs from those of a host, he explains, is often difficult. If color, size and shape are not sufficient, weight and texture of shell are additional aids. In most cases cuckoo's eggs are heavier than other eggs of the same size. The shell is hard though brittle, and feels gritty when handled. Under a lens the shell shows pores and grooves.

Baker considers most female cuckoos as having territory though they are not very closely attached to it. When they have used all the nests of a given area, they move to another area and perhaps later come back to the first. In such cases the territory may extend several miles. He believes that the number of eggs laid by *Cuculus* in a season is between fourteen and twenty. Mating, he thinks, is promiscuous. To explain evolution of egg types under this condition he favors the old and dubious theory that inheritance of kind of egg is through the females only.

The chief value of the book lies in the broad treatment of the many species of cuckoos and their eggs. In this field the work stands, and perhaps will remain, unrivaled. The biology, including the discussion of habits, however, is weak, especially when compared with that of Edgar P. Chance in his recent book, "The Truth About the Cuckoo."—Harry W. Hann.

THE VERTEBRATE EYE AND ITS ADAPTIVE RADIATION. By Gordon Lynn Walls. Bulletin No. 19, Cranbrook Institute of Science, Bloomfield Hills, Mich. 1942: xiv + 785 pp., 197 figs., 1 pl. $6.50.

In the preface the author defines as the aim of this book: "to interpret comparative ocular biology as a whole to those who want to know what the eye is all about, but are repelled by the pedantic terminology of anatomy texts, the mathematics of physiological optics, the scatteredness of the ecological literature, and the German language." This sounds almost like an advertisement for a popularizing pamphlet. Yet the author has much higher ambitions. In fact, on picking up the weighty volume of 800 pages, one may very well feel inclined to

doubt the sincerity of the above quotation. With the same length of print H. G. Wells could explain the structure and function of the whole universe, and this book pretends simply to be a biology of the vertebrate eye, understandable for any "amateur naturalist" and of "particular benefit to zoologists and ecologists, medical and veterinary ophthalmologists, and comparative psychologists." The amazing thing about this book is that it fulfills all these promises. It gives a very complete review and an intelligent interpretation of the accumulated knowledge about eyes, especially that of the last century. Though no attempt is made to spare the reader by withholding procedures or results of meticulously planned and detailed investigations, the book reads like a fascinating novel, almost from the first to the last page. After all, man is eye-minded. In ever new ways do we find that the eye is the window through which we get our views of the universe and through which the outer world enters our conscious minds. There are, therefore, but few subjects in the study of nature that command an interest equal to that of the eye.

The subject is presented in many interestingly varied aspects. A first part contains the basic information concerning the morphology of the eye and the visual process. The second section treats of the adaptations of eyes to the exigencies of general as well as specialized environmental conditions. In the third part the eyes of the vertebrates are intercompared group by group from anatomical as well as physiological viewpoints. Such a triple treatment necessarily involves some repetition, though much of it is avoided by means of a rather unusual system of cross references. The comparative morphology convinces us that the human eye, though one of the most perfected types, is still outclassed by the eyes of many birds, which clearly reach the highest degree of perfection, at least in resolving power. One learns about the thirty theories that have been brought forward in the effort to explain the elaborate morphology of the pecten of the bird's eye, which is intimately correlated with the perfection of visual accommodation, and yet plays no obvious part in its mechanism. Emphasis is placed on evolutionary relationships such as appear in the sauropsidan type of retinal elements in monotremes and marsupials. The eye alone of these lower animals is convincing evidence of the reptilian origin of the whole mammalian class.

The foreign literature, especially the vast and important German portion, is extensively reviewed. Enjoyment of the book is greatly enhanced by about 200 well-chosen text figures (mostly original drawings), but especially by the strictly personal, and always highly expressive style of the author. Indelibly imprinted on the reader's mind remain the "primitive insectivoran knot-hole" through which "squeezed" whatever the higher placentals retained of primitive structural elements—and the phylogenetic tree upon which color perceptions first appeared "like Christmas decorations."

Here is a book that delights while you read it and remains a ready store of information when placed in your library.—Emil Witschi.

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Alexander, Donald Child, 18 Hurd St., Lowell, Massachusetts 1937
Alexander, Gordon, Department of Biology, University of Colorado, Boulder, Colorado 1936
Allan, Philip F[arley], Biology Division, Soil Conservation Service, Washington, D. C. 1939
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Allen, Durward Leon, Rose Lake Wildlife Experiment Station, East Lansing, Michigan 1933
Allen, Francis H[enry], 215 LaGrange St., West Roxbury, Massachusetts .1941
Allen, Robert W., Ossian, Iowa 1936
Allen, Theodore, 2520 Mulberry St., Muscatine, Iowa 1942
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Alpert, Bernard, 170 Broadway, New York City 1939
*Amadon, Dean, American Mus. Nat. Hist., 79th St. and Central Park West, New York City 1935
Amidon, Miss Hilda Farnum, 282 Sigourney, Hartford, Connecticut 1942
*Ammann, Lt. George Andrew, Co. A, 87th Inf. Mountain Reg., Fort Lewis, Washington 1935
Anderson, Anders Harold, R. 5, Box 488, Tucson, Arizona 1937
*Anderson, Dr. George M., Box 4776, Station E, Kansas City, Missouri...1942
Anderson, Harry George, 409 Sidney St., Madison, Wisconsin 1940
Anderson, Miss Helen, Wausau Public Library, Wausau, Wisconsin 1941
Anderson, Sgt. John M., Station Hospital, Camp Sibert, Boulder City, Nevada 1938
Anderson, Dr. Rudolph Martin, Division of Biology, National Museum of Canada, Ottawa, Ontario, Canada 1937
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[1] This list is compiled as of November 1, 1942. The Secretary would appreciate immediate notification of any omission of names and changes in address, or errors in the spelling of names, the use of titles, and the exact year of first election to membership.

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Black, Charles Theodore, Route 3, Grand Ledge, Michigan 1935
*Blain, Dr. Alexander Willis, 2201 Jefferson Ave., E., Detroit, Michigan..1902
*Blake, Emmet R[eid], Field Museum of Natural History, Chicago, Illinois.1939
*Boggs, Ira Brooks, Extension Division, West Virginia University, Morgantown, West Virginia 1938
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Boulton, Rudyerd, 3317 Dent Pl., Washington, D. C. 1942
Bowdish, Beecher Scoville, Demarest, New Jersey 1924
Bowers, J. Basil, 381 51st St., Oakland, California 1942
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Brand, Charles Salmon, R. D. 2, Ithaca, New York 1941
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**Brandreth, Courtney, Ossining, New York 1939
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Coleman, H[enry] S[hirl], Box 254, Faculty Exchange, College Station, Texas 1941
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Comfort, James Earl, 27 N. Iola Dr., Webster Groves, Missouri 1941
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Comstock, W. Ogilvie, New Ipswich, New Hampshire 1942
Conaway, Clinton Harper, 217 Third St., Aurora, Indiana 1942
Conrad, Charles Louis, 423 Warwood Ave., Wheeling, West Virginia 1937
Conway, Albert E., Box 135, West Chester, Pennsylvania 1939
Cooley, Miss Eleanor Graham, Bot.—Chem.—Pharm. Library, University of Iowa, Iowa City, Iowa 1936
Coombes, Robert Armitage Hamilton, Sea Bank, Bolton-le-Sands, Caraforth, Lancashire, England 1939
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Darsie, James C., Box 102, Skyland, North Carolina 1942
Davey, Winthrop N[ewbury], 2485 Hendee Rd., Jackson, Michigan 1941
*Davidson, William Mark, National Research Center, Beltsville, Maryland.1933
Davis, Dr. David Edward, 721 Elmwood Ave., Wilmette, Illinois 1940
Davis, Edwin G., 24 Arlington St., Cambridge, Massachusetts 1941
Davis, George, State Teachers College, Murfreesboro, Tennessee 1936
Davis, George W., 3 Fremont St., Montpelier, Vermont 1941
**Davis, John, The Ivanhoe, Durant Ave., Berkeley, California 1939

Davis, Mrs. Louie Irby, Box 988, Harlingen, Texas 1933
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Dear, Lt. Col. L[ionel] S[extus], Box 127, Port Arthur, Ontario, Canada. 1939
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**Desmond, Hon. Thomas C[harles], 94 Broadway, Newburgh, New York. 1942
Deusing, Murl, 142 N. 75th St., Milwaukee, Wisconsin 1937
Devitt, Otto Edmund, 31 Willowbank Blvd., Toronto, Ontario, Canada... 1935
Dickinson, Mrs. William Winston, 2006 Reid Ave., Bluefield, West Virginia 1942
Dille, Frederick Monroe, 822 Grand Ave., Nogales, Arizona 1912
Dingle, Edward von Seibold, Huger, South Carolina 1921
*Dixon, James Benjamin, R.R., Box 688, Escondido, California 1936
Dobbins, H[ugh] C[linton], 1456 W. Clifton Blvd., Lakewood, Ohio 1941
*Dodge, Victor Kenney, 137 Bell Court, W., Lexington, Kentucky 1935
Dole, J. Wilbur, 51 E. Stone St., Fairfield, Iowa 1930
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Doughty, Jacob P[hinizy], R. 2, Prospect, Kentucky 1940
*Douglas, Donald W., Department of Conservation, Lansing, Michigan.... 1929
Drill, Miss Edna, 202 S. Campus Ave., Oxford, Ohio 1942
Drum, Miss Margaret, Owatonna, Minnesota 1937
Duer, Harry E., 1651 E. 93rd St., Cleveland, Ohio 1941
*Duffield, Mrs. J. W., Frost Lane and Oakwood Drive, Peekskill, New York 1940
*DuMont, Philip Atkinson, Fish and Wildlife Service, Merchandise Mart, Chicago, Illinois 1928
*Duncan, Donald Pendleton, 5841 Nickerson Ave., Chicago, Illinois 1936
.. Dusi, Julian Luigi, 886 Wilson Ave., Columbus, Ohio 1941
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Dwight, Edward Harold, 1019 Redway Ave., Cincinnati, Ohio 1942
*Eastman, Whitney H[askins], 1004 Summit Ave., Minneapolis, Minnesota. 1941
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Eaton, Stephen Woodman, 808 S. Main St., Geneva, New York 1942
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Edmonds, Mrs. Elaine, Keene Valley, New York 1941
Edward, James G., Jr., 2 Whitwell Ave., Newport, Rhode Island 1942
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Eifert, Mrs. Virginia S., Illinois State Museum, Springfield, Illinois 1941
*Eifrig, Prof. Charles William Gustave, Windermere, Orange Co., Florida.. 1907
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Ellis, Miss Hazel R., Kenka College, Kenka Park, New York 1942
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Emerson, David L[owell], 25 Everett Ave., Providence, Rhode Island... 1939

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*Emilio, Shepard Gilbert, 7 Winter St., Salem, Massachusetts 1929
Emlen, Miss Eleanor Cope, Awbury, Germantown, Philadelphia, Pennsylvania 1942
Emlen, Dr. John Thompson, Jr., University of California, Davis, California 1936
Empey, Miller, Freeland, Michigan 1939
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Ennis, James Harold, Cornell College, Mount Vernon, Iowa 1942
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*Erickson, Miss Mary Marilla, Santa Barbara State College, Santa Barbara, California 1930
Erickson, Ray C[harles], 1104 Washington Ave., St. Peter, Minnesota....1939
*Errington, Dr. Paul L[ester], Iowa State College, Ames, Iowa 1932
Etz, Mrs. Elizabeth [Cecilia], Thornhedge, Wheeling, West Virginia 1940
**Eustice, Alfred LeRoy, Bright Land Farm, Barrington, Illinois 1941
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Faegre, David [Colin], Belfield, Stark Co., North Dakota 1940
Fahrenholz, Fred Emery, 2912 Elmo Place, Middleton, Ohio 1942
Fales, John House, 1917 Elkhart St., Silver Spring, Maryland 1939
**Fargo, William Gilbert, 506 Union St., Jackson, Michigan 1923
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*Fiorucci, Americo Angelo, Box 5, Iron Mountain, Michigan 1941
Fischer, Richard Bernard, 140–19 Beech Ave., Flushing, New York 1942
Fisher, Josiah Howe Vose, Theta Delta Chi, Williamstown, Massachusetts.1942
Fitzgerald, Mrs. Mary Elizabeth, R. 5, Box 480, Kirkwood, Missouri....1942
Fleetwood, Raymond Judy, Piedmont Wildlife Ref., Round Oak, Georgia 1934
Flentge, Louis George, 1564 Thacker St., Des Plaines, Illinois 1936
Fleugel, James B., 1104 American National Bank Bldg., Kalamazoo, Michigan 1942
Floyd, E[arl] Pershing, 303 E. 18th St., Tulsa, Oklahoma 1939
*Floyd, Judge Joseph Larke, 1009–11 George D. Harter Bank Bldg., Canton, Ohio 1903
Flynn, Michael Burke, 415 S. Crouse Ave., Syracuse, New York 1942
*Foote, Maurice Edwin, R. 1, Mantua, Ohio 1932
Ford, Edward Russell, Newaygo, Michigan 1914
Forsyth, Mrs. Louise [Ann], Lebanon Rd., Hanover, New Hampshire ...1940
Fox, Adrian Caspar, Box 465, Lincoln, Nebraska 1937
France, H[oward] Owen, 821 Lincoln Place, Boulder, Colorado 1941
*Fredine, C[larence] Gordon, Department of Forestry and Conservation, Purdue University, Lafayette, Indiana 1938
Freeman, Robert M., R. 5, Laurel, Mississippi 1939
*French, Franklin C[ulbertson], 18102 Devonshire Rd., Northridge, California 1941
*Fruen, J[ohn] Donald, 1641 Brenner Pass, Tyrol Hills, Minneapolis, Minnesota 1940
Frye, Ozro Earle, Jr., Department of Fish and Game, A.&M. College of Texas, College Station, Texas 1940
*Fryklund, P. O., Roseau, Roseau Co., Minnesota 1926

*Furniss, Owen Cecil, 2203 1st Ave., West Prince Albert, Saskatchewan, Canada 1934
Furth, John [Thomas], 436 Felton Ave., Highland Park, New Jersey....1939
*Gabrielson, Dr. Ira Noel, Fish & Wildlife Service, Merchandise Mart, Chicago, Illinois 1913
Gadd, Samuel Wesley, II, 1019 N. Nevada Ave., Colorado Springs, Colorado 1941
*Gaillard, Stephen Lee, 9 Lee Place, Bronxville, New York 1942
**Ganier, Albert F[ranklin], 2112 Woodlawn Dr., Nashville, Tennessee....1915
Garrett, Miss Lois, 1709 Chestnut St., Kenova, West Virginia 1942
Garrison, David L., 121 Highland St., West Newton, Massachusetts....1940
*Gavin, Angus, Hudson's Bay House, Main St., Winnipeg, Manitoba, Canada 1942
Gensch, Robert H[enry], Lake States Forest Experiment Station, University Farm, St. Paul, Minnesota 1939
George, John L[othar], % J. Van Tyne, Museum of Zoology, Ann Arbor, Michigan 1939
Gerstell, Richard, Pennsylvania Game Commission, Harrisburg, Pennsylvania 1939
Gibbs, Harold N[elson], A-71 Sowams Rd., Barrington, Rhode Island...1941
Gibbs, Walter C., Whitehall, Michigan 1941
Gier, Dr. Herschel Thomas, Ohio University, Athens, Ohio 1937
Gifford, Dr. Harold, 3636 Burt, Omaha, Nebraska 1936
Gilbert, Perry Webster, Department of Zoology, Cornell University, Ithaca, New York 1942
Gillett, Francis C., 828 Plymouth Bldg., Minneapolis, Minnesota 1935
Gillette, Delbert A., R. 5, Yakima, Washington 1942
Gillette, Miss Fredericka B., 1319 Forest Ave., Ann Arbor, Michigan 1938
Giltz, Maurice L[eroy], 841 Lincoln Way, N.W., Massilon, Ohio 1939
Ginn, W[illiam] E[dward], 511 East Van Buren, Columbia City, Indiana 1941
Glasgow, Leslie L., Portland, Indiana 1942
Glenn, Robert W., 509 Orchard Ave., Avalon, Pittsburgh, Pennsylvania..1934
Gloyd, Dr. Howard Kay, Chicago Academy of Sciences, 2001 N. Clark St., Chicago, Illinois 1925
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Good, Ernest E[ugene], 283 S. 4th St., Orleans, Indiana 1940
Goodell, Fred C[harles], Edmore, Michigan 1940
Gooden, [Elmer] Clayton, Glasgow, Kentucky 1941
*Gordon, J. Halford, 152 E. Sixth Ave., Roselle, New Jersey 1942
Goslin, Charles R[ussell], 407 Washington Ave., Lancaster, Ohio 1940
*Grange, Wallace, Babcock, Wisconsin 1941
*Grant, Cleveland Putnam, 620 Greenup St., Covington, Kentucky....1928
Graves, Miss Katherine, 1209 N. Illinois St., Indianapolis, Indiana....1942
*Gray, William Arthur, Room 690, 508 S. Dearborn St., Chicago, Illinois..1938
Greeley, Fred, 200 Chestnut St., Winnetka, Illinois 1942
Green, Miss Rhoda J[anet], 1769 Bardstown Rd., Louisville, Kentucky..1940
**Greene, Albert E., 1841 Cambridge Rd., Ann Arbor, Michigan 1939
Greene, Earle Rosenbury, Box 466, Key West, Florida 1930
Greenhalgh, Clifton M., Kanab, Utah 1939
*Gregg, Miss Pearl, Middlebourne, West Virginia 1942
*Gregory, Stephen Strong, Jr., Box N., Winnetka, Illinois 1922
Griffin, Donald R[edfield], Biology Laboratory, Harvard University, Cambridge, Massachusetts 1941
Grimes, 825 South Shores Drive, Jacksonville, Florida 1924
*Grimm, William C[arey], 613 S. Braddock Ave., Pittsburgh, Pennsylvania 1939
Grinnell, Lawrence I[rving], 710 Triphammer Rd., Ithaca, New York....1939

*Griscom, Ludlow, Museum of Comparative Zoology, Cambridge, Massachusetts 1937
Griswold, John A[ugustus], Jr., 115 South St., Auburn, New York 1941
Grose, E. R., Glenville, West Virginia 1939
Groskin, Horace, 210 Glenn Rd., Ardmore, Pennsylvania 1937
*Gross, Dr. Alfred Otto, Bowdoin College, Brunswick, Maine 1927
Grossenheider, Richard P., 5415 Gilmore Ave., St. Louis, Missouri 1940
Gunderson, Harvey Lorraine, % H. Gunderson, Gary, Minnesota 1941
Haak, A[drian], 437 Eugenie St., St. Boniface, Manitoba, Canada 1939
Haas, Miss Bernece Estelle, Bowdon, North Dakota 1940
Hackett, Miss Cora Janet, 3934 Avery Ave., Detroit, Michigan 1941
*Haecker, Frederick Woods, 506 S. 52nd St., Omaha, Nebraska 1938
*Hagar, Mrs. Jack, Box 339, Rockport, Texas 1930
*Hague, Dr. Florence S., Sweet Briar College, Sweet Briar, Virginia 1931
Hahn, Miss Helen H[amilton], 968 Jefferson Ave., Akron, Ohio 1941
Haines, T. P., 1428 White St., Ann Arbor, Michigan 1941
*Hainsworth, William Pickard, 216 Railroad Ave., North Andover, Massachusetts 1930
*Hallman, Roy Cline, Box 826, Panama City, Florida 1928
*Hamerstrom, Frederick N., Jr., Edwin S. George Reserve, Pinckney, Michigan 1934
Hamilton, Mrs. R. E., 208 College St., Dalton, Georgia 1942
*Hamilton, Dr. William J[ohn], Jr., Department of Zoology, Cornell University, Ithaca, New York 1933
Hammond, Merrill C[lyde], Lower Souris Refuge, Upham, North Dakota.1939
*Handley, Charles Overton, Virginia Polytechnic Institute, Blacksburg, Virginia 1925
*Handley, Charles Overton, Jr., Blacksburg, Virginia 1941
*Hann, Dr. Harry Wilbur, Department of Zoology, University of Michigan, Ann Arbor, Michigan 1930
Hanna, Wilson Creal, 141 E. F St., Colton, California 1936
Hanson, E. C., 1305 Wisconsin Ave., Racine, Wisconsin 1940
Hanson, H. C., U.S.N.A.S., Grosse Ile, Detroit, Michigan 1939
Happ, Prof. George Bippus, The Principia College, Elsah, Illinois 1935
Hardy, [Cecil] Ross, Dixie College, Saint George, Utah 1940
*Harkness, Reed B., 4908 Laclede Ave., St. Louis, Missouri 1942
*Harper, Dr. Francis, 224 S. Chester Rd., Swarthmore, Pennsylvania 1930
**Harriot, Samuel Carman, 200 W. 58th St., New York City 1934
*Harris, Russell B[enjamin], Arcanum, Ohio 1941
Harrison, Mrs. G. O., 628 Lynn Ave., Weston, West Virginia 1942
*Harrison, Harold Holmes, The Valley Daily News, Tarentum, Pennsylvania 1941
*Hartman, Frank A[lexander], Hamilton Hall, Ohio State University, Columbus, Ohio 1941
*Hartwell, Arthur Mowry, 2324 Lake Place, Minneapolis, Minnesota 1940
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Hausler, Mrs. M., 7348 Paxton Ave., Chicago, Illinois 1936
**Havemeyer, Henry Osborne, Mahwah, New Jersey 1930
Hawkins, B. L., Hamline University, St. Paul, Minnesota 1936
Hearne, Miss Clara Josephine, Box 68, Roanoke Rapids, North Carolina..1942
Hebard, Frederick V., 1500 Walnut St. Bldg., Philadelphia, Pennsylvania..1940
Heckler, S. B., 1207 N. 7th St., St. Louis, Missouri 1942
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Heiser, J[oseph] M[atthew], Jr., 1724 Kipling St., Houston, Texas 1939

Helfer, Miss Louise, 111 Ninth St., Watkins Glen, New York 1937
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*Henderson, Walter Cleaveland, 8 Magnolia Parkway, Chevy Chase, Maryland 1928
*Hendrickson, Dr. George Oscar, Department of Zoology, Iowa State College, Ames, Iowa 1933
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Hill, Mrs. Julian Werner [Mrs. Louisa B.], 1106 Greenhill Ave., Wilmington, Delaware 1935
Hill, Norman Pierce, 15 Oxford St., Arlington, Massachusetts 1941
Hill, Raymond W., 3316 Kenmore Rd., Shaker Heights, Cleveland, Ohio..1941
*Hillmer, Davis B., 448 W. Ferry Ave., Detroit, Michigan 1926
*Hilton, Dr. David Clark, 305 Richards Bldg., Lincoln, Nebraska.....1918
*Hinds, Frank J., Department of Biology, Western State Teachers College, Kalamazoo, Michigan 1935
Hinshaw, Thomas Doane, Museum of Zool., Ann Arbor, Michigan.....1926
Hitchcock, John D., Bee Culture Laboratory, Laramie, Wyoming 1941
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Hoodema, Richard, 116 W. 14th St., Holland, Michigan 1941
Horton, Mrs. Louise D., 360 Prospect St., Fall River, Massachusetts.....1941
Hostetter, D[avid] Ralph, Eastern Mennonite School, Harrisonburg, Virginia 1937
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Hotchkiss, Neil, Patuxent Research Refuge, Bowie, Maryland 1940
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Huggins, Russell A., Eastern State Teachers College, Madison, South Dakota 1937
*Hughes, George Thomas, R. 3, Plainfield, New Jersey 1929
Hulbert, Lloyd Clair, 529 W. Grand River Ave., East Lansing, Michigan..1938
*Hunt, Ormond Edson, 14-133 General Motors Bldg., Detroit, Michigan..1937
Hunter, Lawrence E., Middle Grove, Illinois 1934
Hurley, John Beatty, 401 S. 17th Ave., Yakima, Washington 1937
Hutchinson, Arthur E., Chester Springs, Chester Co., Pennsylvania.....1940
Hutchinson, Miss Cora W., 311 Prospect St., Alton, Illinois 1942
Hyde, A[ethus] Sidney, University of Idaho, South Branch, Pocatello, Idaho 1939
Imsick, Roy Christian, 7512 N. 20th St., Philadelphia, Pennsylvania 1941
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**Ingersoll, Marion Crory, 380 Clinton Ave., Brooklyn, New York 1942

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Jaques, F[rancis] L[ee], 610 W. 116th St., New York City 1939
Jameson, Everett Williams, Jr., 216 Delaware Ave., Ithaca, New York..1941
Jameson, John D., Sugar Hill, New Hampshire 1941
*Jamison, Conrad Heston, 2811 Acklen Ave., Nashville, Tennessee 1940
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Jarvis, Carson M[cAllister], Med. Det. Dept., 1213 R. C., Fort Niagara, New York 1940
Jenkins, James H[obart], Wildlife Research Station, Ohio State University, Columbus, Ohio 1939
*Jenner, William Alexander, 806 W. Davis St., Fayette, Missouri 1933
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Johnson, Perry Frank, Y.M.C.A., Michigan City, Indiana 1935
*Johnson, Mrs. Irene W., 38 Portland Place, St. Louis, Missouri 1931
*Johnson, Robert Anthony, 150 East St., Oneonta, New York 1930
Johnson, William M[cNutt], 108 E. Depot St., Knoxville, Tennessee ...1939
Johnston, Miss Irma K., 23 Dewey Ave., Huntington, New York 1941
Johnston, Miss Verna R[uth], Thornton Township High, Harvey, Illinois.1941
*Jonah, Miss Christie May, 407 River St., Hackensack, New Jersey.....1942
*Jones, Harold Charles, Thomas Berry College, Mount Berry, Georgia....1929
*Jones, John Courts, Research Center, Delmar, New York 1931
****Jones, Dr. Lynds, 352 W. College St., Oberlin, Ohio.....Founder
Jones, Paul F., R. 1, Howard City, Michigan 1937
Jones, Victor Emmons, University of Idaho, Southern Branch, Pocatello, Idaho 1938
Jorae, Miss Irene Frances, Central Michigan College of Education, Mt. Pleasant, Michigan 1942
Jurica, E., Lisle, Illinois 1940
Kahmann, Mrs. Karl W., R. 2, Hayward, Wisconsin.....1941
Kahn, Mrs. Dina Hope, 1122 Michigan Ave., Ann Arbor, Michigan.....1938
*Kalmbach, Edwin Richard, Fish and Wildlife Service, 546 Customhouse, Denver, Colorado 1926
*Kase, John Charles, Versailles, Indiana 1937
Kaufman, Herbert P[eter], 30 N. 28th St., Harrisburg, Pennsylvania....1941
*Kelker, George Hills, School of Forestry, U.S.A.C., Logan, Utah.....1938
Kelly, Mrs. George A. [Mrs. Evelyn], 2300 La Salle Gardens, N., Rochester, Michigan 1935
*Kelso, Leon, 1370 Taylor St., N.W., Washington, D.C. 1930
*Kendeigh, Dr. S[amuel] Charles, Vivarium Bldg., University of Illinois, Champaign, Illinois 1923
Kennedy, H. N., Box 294, Rosslyn Station, Arlington, Virginia 1924
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*Kieran, John, 4506 Riverdale Ave., Bronx, New York City 1942
*Killion, Jack C., 6916 Valjean Ave., Danbury, Connecticut 1942
Kindler, Mrs. Grace Emma, Sheridan Dr., Lancaster, Ohio 1937
Kinzel, Carl, 4149 N. 52 St., Milwaukee, Wisconsin 1941
Kirk, Allan D[ixon], 14 Forest Hill Rd., Wilkinsburg, Pennsylvania 1939
Kirkpatrick, Charles Milton, Department of Forestry, Purdue University, Lafayette, Indiana 1941
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*Klinkerfuss, Mrs. G. H., 340 Bermuda Ave., Normandy, Missouri 1941
Klonic, Allan S., 28 Ericsson St., Rochester, New York 1941
Kluge, Helen H[enrika], 216 Woodlawn Terrace, Waterbury, Connecticut.1942
*Knapp, Elmer Leslie, R. 2, Troy, Pennsylvania 1930
Knight, Charles Harold, 20700 Gladstone Rd., Cleveland, Ohio 1939

Knox, Miss Margaret Richardson, 4030 Park Ave., Indianapolis, Indiana.1937
Koch, Peter, Terrace Park, Ohio 1939
Koehler, Mrs. Arthur, 109 Chestnut St., Madison, Wisconsin 1941
Koestner, E. J., Box 263, Piper City, Illinois 1938
Kolb, Charles Haven, Jr., 5210 Catalpha Rd., Baltimore, Maryland 1937
Kosten, John Leonard, 967 Pine Ave., Grand Rapids, Michigan 1939
Kozacka, Frank J[oseph], 81 Cedar St., Amesbury, Massachusetts.....1941
Kramer, Theodore Christian, Department of Anatomy, East Medical Bldg., Ann Arbor, Michigan 1939
Kraus, Douglas L., Rhode Island State College, Kingston, Rhode Island..1942
Kreag, Keith K., R. 2, Box 196, Lansing, Michigan 1942
Kuerzi, Richard C., R.F.D., Kent, Connecticut 1942
Kuitert, Lt. Louis Cornelius, 706 Florence St., Kalamazoo, Michigan.....1938
*Kutz, Harry Leon, Game Research Center, Delmar, New York 1939
Kyllingstad, Henry C[arrell], Mountain Village, Alaska 1940
Lacey, Miss Mifton H., % Canton Girl Scouts, 433 Tusc. W. Headquarters, Canton, Ohio 1939
Laffoon, Jean [Luther], 1401 W. 3rd St., Sioux City, Iowa 1940
Lagler, Dr. Karl F., Department of Zoology, University of Michigan, Ann Arbor, Michigan 1941
Lake, Robert N., Wilton, New Hampshire 1941
*Lambert, Bert, 16854 Wildemere Ave., Detroit, Michigan 1936
Lamore, Donald Hart, 1920 Grace Church Rd., Silver Spring, Maryland..1942
Lanning, Robert George, 56 Chatsworth Dr., Toronto, Ontario, Canada..1942
Larrabee, Miss Harriet, Y.W.C.A., Duluth, Minnesota 1942
*Larrabee, Prof. Austin Park, Yankton College, Yankton, South Dakota...1921
*Laskey, Mrs. Amelia Rudolph, Graybar Lane, Nashville, Tennessee 1928
Latham, Roger M., R. 2, West Chester, Pennsylvania 1942
Lawrence, Pvt. Roger William, Med. Det., 197th Coast Art., (A.A.), A.P.O. 111, Postmaster, San Francisco, California 1942
Lay, Daniel Wayne, Game, Fish, and Oyster Commission, Austin, Texas..1939
Lea, Robert Bashford, 737 Center St., Elgin, Illinois 1940
Lee, Dr. Howard James, 100 Elmwood, Oshkosh, Wisconsin 1941
Leedy, Dr. Daniel Lovey, Ohio Wildlife Research Station, Ohio State University, Columbus, Ohio 1936
Leenhouts, Miss Pearle Esther, Pease Rd., Williamson, New York 1941
Legg, William C[larence], Mt. Lookout, West Virginia 1939
Leonard, Mrs. J. W., Hunt Creek Experiment Station, Lewiston, Michigan 1941
*Leopold, Prof. Aldo, 424 University Farm Place, University of Wisconsin, Madison, Wisconsin 1928
Leopold, A[ldo] Starker, Box 247, West Plains, Missouri 1940
Lesher, S. W., 107 W. Boone St., Salem, Illinois 1941
Lessard, Pvt. Robert A., Med. Det., 197th Coast Art. (A.A.), A.P.O. 111, Postmaster, San Francisco, California 1942
Levy, Mrs. Alice K[lund], 235 E. 22 St., Apt. 11T, New York City.....1941
Lewis, Dr. Harrison Flint, Lands, Parks, and Forest Branch, Department of Mines and Resources, Ottawa, Ontario, Canada 1939
Lewis, Brother Hubert, Cretin High School, St. Paul, Minnesota 1940
*Lewy, Dr. Alfred, 2051 E. 72nd Place, Windsor Park, Chicago, Illinois...1915
Lincoln, Frederick Charles, Fish and Wildlife Service, Washington, D.C...1914
Lindsey, Dr. Alton Anthony, 103 S. Stanford St., Albuquerque, New Mexico 1936
Lindzey, James S., 901 W. 22nd St., Wilmington, Delaware 1942
*Linsdale, Dr. Jean Myron, Jamesburg Route, Monterey, California 1928
Linton, M[orris] Albert, 315 E. Oak Ave., Moorestown, New Jersey 1941
Lloyd, Clark K., 119 N. Pearl St., Richmond, Indiana 1925

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Lockley, R. M., Skokholm Bird Observatory, Dale, Haverfordwest, Pembrokeshire, Wales, Great Britain 1940
Lodge, William Ralph, Silver Lake Estates, R. 2, Cuyahoga Falls, Ohio...1935
Loefer, John B[enjamin], 28 Chestnut St., Berea, Kentucky 1941
Long, Miss Janie, 319 Hawthorne, Greensburg, Pennsylvania 1942
Long, Samuel T., Ohio Wildlife Research Station, Ohio State University, Columbus, Ohio 1941
Lord, Mrs. Caroline Morse, R.F.D., Francestown, New Hampshire....1942
Lord, Dr. Frederick P[omeroy], 39 College St., Hanover, New Hampshire 1939
*Loring, Miss Elizabeth, 176 Ashland St., Melrose Highlands, Massachusetts 1942
Lovell, Harvey B., 3011 Meade Ave., R. 3, Box 216, Louisville, Kentucky.1936
*Lovett, Emery, Jr., 2621 Via Ramon, Palos Verdes Estates, California ..1942
Low, Dr. Jessop, Illinois Natural History Survey, Havana, Illinois 1941
*Low, Seth Haskell, Salt Plains Wildlife Refuge, Fish and Wildlife Service, Jet, Oklahoma 1931
***Lowery, George Hines, Jr., Museum of Zool., Louisiana State University, University, Louisiana 1937
*Lubin, Seymour I., 101 Chestnut St., Binghampton, New York 1934
*Ludwig, Claud Charles, 506 Wilson Bldg., Lansing, Michigan 1938
Ludwig, Dr. Frederick Edwin, 2864 Military St., Port Huron, Michigan..1941
Lum, Miss Elizabeth C[aroline], Cincinnatus, New York 1940
*Lunk, William, Jr., Fleming Ave., Edgemont, Fairmont, West Virginia...1937
Luthy, Ferd, Jr., 306 N. Institute, Peoria, Illinois 1937
Lynes, Miss Florence A., Cook's Station, Missouri 1937
MacArthur, John W[ood], 200 Glencairn Ave., Toronto, Ontario, Canada 1941
MacDonald, Charles Edwin, 8 Sussex Ave., Toronto, Ontario, Canada....1942
MacDonald, Donald L[aurie], 72 Alexander Blvd., Toronto, Ontario, Canada 1941
*MacDonald, Kenneth F., Fort Niobrara National Wildlife Refuge, Valentine, Nebraska 1941
MacLean, Miss Dorothy W[illiams], 21 Ashley St., Hartford, Connecticut.1939
MacLulich, Dr. D. A., 144 Mavety St., Toronto, Ontario, Canada....1933
*MacMartin, Mrs. W. G., 602 State St., Tama, Iowa 1942
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McBeath, Donald Young, L'Anse, Michigan 1936
McCabe, Robert Albert, 1610 S. Union St., Milwaukee, Wisconsin 1942
McCann, Lester J., 3743 Emerson Ave., N., Minneapolis, Minnesota....1939
McClanahan, Robert Charles, Fish and Wildlife Service, Washington, D.C..1935
McClelland, Elizabeth, Eicher Rd., R. 3, Bellevue, Pennsylvania 1942
McClure, H. Elliott, 315 S. 17th St., Ord, Nebraska 1942
McCollough, Miss Leta, Chicora, Pennsylvania 1942
*McCreary, Otto, Agr. Hall, University of Wyoming, Laramie, Wyoming..1930
*McCullagh, Dr. E[rnest] Perry, 2020 E. 93rd St., Cleveland, Ohio....1937
McDonald, Malcolm, Parsons College, Fairfield, Iowa....1936
McGraw, Charles F[rancis], 1006 S. Locust St., Champaign, Illinois....1940
McGraw, Harry A., 1600 5th Ave., Altoona, Pennsylvania 1936
McHugh, Janet Procter, 123 Lafayette Circle, Cincinnati, Ohio 1942
***McIlhenny, Edward Avery, Avery Island, Louisiana 1910
McIntosh, William Baxter, 414 Oakridge Blvd., Lynchburg, Virginia 1942
*McKnight, Edwin Thor, 5038 Park Place, Friendship Station, Washington, D.C. 1936
*McMath, Robert R., R. 4, Pontiac, Michigan 1934

McMurray, Arthur, 2110 Jones Ave., Nashville, Tennessee 1939
McMurray, Frank B[ailey], Wichita Mountains Wildlife Refuge, Cache, Oklahoma 1939
*McNeil, Dr. Charles Andrew, 111 W. Fourth St., Sedalia, Missouri 1914
McNish, Edgar Mann, Madison, Tennessee 1940
Mack, Horace Gordon, % Gilson Mfg. Co., Ltd., Guelph, Ontario, Canada.1937
Madden, Will Earl, Box 173, Rensselaer, Indiana 1942
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Magney, Mrs. G. R., 5329 Washburn Ave., S., Minneapolis, Minnesota...1940
Maguire, Walter Stanley, 216 3rd St., New Westminster, British Columbia, Canada 1937
Malan, Harriss C., 426 Packard St., Ann Arbor, Michigan 1942
Malley, Philip Patrick, 823 Sunshine Ave., Youngstown, Ohio 1935
Manners, Edward Robert, 233 Maple Ave., Westville, New Jersey 1942
Manville, Richard H[yde], Museum of Zoology, University of Michigan, Ann Arbor, Michigan 1941
Manz, Pvt. Frank J., Jr., 12th Technical School Squadron, Scott Field, Illinois 1938
*Marsh, Vernon L., Johnson Hall, University of Washington, Seattle, Washington 1934
Marshall, D. M[cArthur], Hornings Mills, Ontario, Canada 1941
Marshall, William H., Room 415, Federal Bldg., Boise, Idaho 1942
Martin, Miss Dorothy May, Paige Hill Rd., Goffstown, New Hampshire..1942
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Mason, Miss Esther, 2523 Montgomery St., Louisville, Kentucky 1941
Mather, Miss Clara-Louise, 104 Hillcrest Rd., Windsor, Connecticut....1942
Mathiak, Harold A[lbert], Babcock, Wisconsin 1941
*Mayfield, Dr. George Radford, Vanderbilt University, Nashville, Tennessee 1917
Mayfield, Harold F[ord], 3311 Parkwood Ave., Toledo, Ohio 1940
*Mayr, Dr. Ernst, American Museum of Natural History, Central Park West at 79th St., New York City 1933
Mead, Frank W[aldreth], 227 Brighton Rd., Columbus, Ohio 1941
Meade, Dr. Gordon Montgomery, Strong Memorial Hospital, 260 Crittenden Blvd., Rochester, New York 1937
Mellinger, E. O., North Lima, Ohio 1939
Meltvedt, Burton W., Paullina, Iowa 1930
Menaboni, Athos, 1111 Cook Rd., Dunwoody, Georgia 1941
Mendall, Howard L., 28 Pendleton St., South Brewer, Maine 1936
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*Meyer, Mrs. Marie McGinley, 1125 Lane Ave., Tarentum, Pennsylvania..1941
Michaud, Howard H[enry], 1205 Kensington Blvd., Fort Wayne, Indiana 1938
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Miller, Alden Holmes, Museum of Vertebrate Zoology, Berkeley, California 1930
*Miller, Douglas Scott, 122 Lawrence Ave., E., Toronto, Ontario, Canada..1939
Miller, Loye (Holmes), University of California at Los Angeles, Los Angeles, California 1939
Miller, Richard Fields, 2627 N. Second St., Philadelphia, Pennsylvania....1942
Mills, Robert H[enry], 2466 Medary Ave., Columbus, Ohio.....1941
Milnes, Miss Hattie Kernahan, 331 Gowen Ave., Philadelphia, Pennsylvania 1935

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*Mitchell, Mrs. Osborne, R. 1, Streetsville, Ontario, Canada 1933
Mitchell, Robert H., 19 S. Liberty St., New Concord, Ohio 1941
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Mohler, Levi L., Box 623, Ogallala, Nebraska 1942
Mohr, Dr. Carl Otto, Illinois Natural History Survey, Urbana, Illinois..1936
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*Moore, Miss Dora, 60 E. Mulberry St., Athens, Ohio 1934
Moore, George A., R. 3, Stillwater, Oklahoma 1938
Moore, George M[itchell], 210 S. College Dr., Bowling Green, Ohio 1942
Moore, Miss Laura Brooks, French Creek, West Virginia 1941
Moore, Miss Louise Christine, 766 N.W. 13th Ave., Miami, Florida 1940
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Moore, Robert Thomas, R. 1, Box 28A, Pasadena, California 1941
Moorman, Robert B., 137 Lynn St., Ames, Iowa 1941
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**Mudge, Edmund W., Jr., 4105 Averill Way, Dallas, Texas 1939
Mueller, Walter Josef, 3043 N. Prospect Ave., Milwaukee, Wisconsin....1936
Muirhead, Miss Peggy, 608 E. State, Ithaca, New York 1940
Mundy, Miss Barbara B., 1009 Park Ave., New York City 1942
Munro, James Alexander, Okanagan Landing, British Columbia, Canada..1935
*Munter, Capt. William Henry, U.S. Coast Guard, 550 Federal Bldg.,
Seattle, Washington 1933
Murdock, James Ingram, 311 Irving Ave., Glendale, California 1940
*Murie, Adolph, Jackson, Wyoming 1932
*Murie, Olaus Johan, Jackson, Wyoming 1934
*Murray, Rev. Joseph James, Lexington Presbyterian Church, Lexington,
Virginia 1931
*Musgrave, Dr. John Knox, 350 Parkway Dr., Pittsburgh 16, Pennsylvania.1937
Musselman, T[homas] E[dgar], 124 S. 24th St., Quincy, Illinois 1940
Nash, Nathaniel C[ushing], 1 Reservoir St., Cambridge, Massachusetts..1941
*Neely, William W., 149 West End St., Chester, South Carolina 1939
*Neff, Johnson Andrew, 546 Custom House, Denver, Colorado 1920
Nelles, Arthur D., 223 McLeod St., Ottawa, Ontario, Canada 1940
*Nelson, Arnold Lars, Fish and Wildlife Service, Washington, D.C. 1932
Nelson, Charles Ellsworth, Jr., 124 Oxford Rd., Waukesha, Wisconsin....1937
Nelson, Edwin L[ewis], 77 Adelaide Ave., New Brunswick, New Jersey..1939

Nelson, Martin Knute, State Game Warden, Fertile, Minnesota 1939
**Nelson, Dr. Theodora, 2695 Heath Ave., New York City 1928
Nelson, Urban C., Soil Conservation Service, Cannon Falls, Minnesota....1939
Netting, M. Graham, Carnegie Museum, Pittsburgh, Pennsylvania 1941
Newcomer, Miss Ruth Chisholm, "Folly Hill," Novelty, Ohio 1942
Newman, B. Barnett, 343 E. 19th St., New York City 1942
*Newth, Donald J[ennings], 480 W. Kirby St., Detroit, Michigan 1939
Newton, Earl T[homas], 5500 College St., Kansas City, Missouri 1939
*Nice, Dr. Leonard B., 5708 Kenwood Ave., Chicago, Illinois 1932
*Nice, Mrs. Margaret Morse, 5708 Kenwood Ave., Chicago, Illinois 1921
*Nichols, Charles Ketcham, 212 Hamilton Rd., Ridgewood, New Jersey..1933
Nichols, John Treadwell, American Museum of Natural History, Central Park West at 79th St., New York City 1941
Nichols, L[eon] Nelson, 331 E. 71st St., New York City 1937
Norris, Robert Allen, 1408 N. College Ave., Tifton, Georgia 1941
Norris, Russell T[aplin], Box 847, Preston Laboratory, Butler, Pennsylvania 1939
*Norse, William J[ohn], 531 W. 211th St., New York City 1939
North, George Webster, 249 Charlton Ave., Hamilton, Ontario, Canada..1941
*Norton, Arthur Herbert, Portland Society of Natural History, 22 Elm St., Portland, Maine 1934
*Oberholser, Dr. Harry Church, Cleveland Museum of Natural History, Cleveland, Ohio 1894
O'Conner, Miss Esther Laura, 4344 Locust Avenue, Kansas City, Missouri.1940
*Odum, Dr. Eugene Pleasants, Department of Zoology, University of Georgia, Athens, Georgia 1930
*Ohern, D. W., 515 N.W. 14th St., Oklahoma City, Oklahoma 1938
Oliver, Miss Mary Clara, Ganado Mission, Ganado, Arizona 1934
Olsen, Humphrey A., Brevard College, Brevard, North Carolina 1941
*Olsen, Dr. Richard Ellsworth, St. Joseph's Hospital, Pontiac, Michigan..1937
Olson, Mrs. Gladys E., 17906 Lake Rd., Lakewood, Ohio 1942
*Osgood, Dr. Wilfred Hudson, Field Museum of Natural History, Chicago, Illinois 1910
Osmer, Thomas L[ewis] G[regory], 2777 Flint River Rd., Lapeer, Michigan 1939
*Otis, Dr. Charles Herbert, Department of Biology, Bowling Green State University, Bowling Green, Ohio 1937
Ott, Frederick Louis, 2527 N. Wahl Ave., Milwaukee, Wisconsin 1941
*Overing, Robert, R.F.D., Raleigh, North Carolina 1930
*Owre, Oscar, Jr., 2625 Newton Ave., S., Minneapolis, Minnesota 1935
*Palmer, Ralph Simon, Department of Zoology, Vassar College, Poughkeepsie, New York 1934
*Palmer, Dr. Theodore Sherman, 1939 Biltmore St., N.W., Washington, D.C. 1914
Parker, Henry M[elville], 122 School St., Concord, New Hampshire 1941
Parker, Lansing A[rthur], 1133 N. Chatsworth, St. Paul, Minnesota 1939
Parks, Richard A., 546 Morgan St., N.E., Atlanta, Georgia 1942
Paschen, Miss Margaret F., 7 S. Balch St., Hanover, New Hampshire ...1941
Patterson, Miss LaRue, 344 Ridge Ave., New Kensington, Pennsylvania..1942
Paxton, Thomas R[ice], 1064 E. Clifton Rd., N.E., Atlanta, Georgia 1941
*Pearce, John, Wildlife Research Station, University of Maine, Orono, Maine 1939
*Peartree, Edward William, 425 S. State St., Oconomowoc, Wisconsin 1941
*Peasley, Dr. Harold Raymond, Bankers Trust Bldg., Des Moines, Iowa..1941
*Peasley, Mrs. Harold Raymond, 2001 Nash Dr., Des Moines, Iowa 1934

Peavey, Mrs. Leonore Gastineau, 4222 Carrollton St., Indianapolis, Indiana 1937
Peelle, Prof. Miles L., 329 Rice St., Adrian, Michigan 1940
*Peet, Dr. Max Minor, 2030 Hill St., Ann Arbor, Michigan 1935
Peil, Miss Helen, 2064 Sherwood Ave., Louisville, Kentucky 1941
Pell, S[tuyvesant] Morris, Huron Mountain Club, Marquette Co., Michigan 1938
*Pemberton, John Roy, 1244 Morada Place, Altadena, California 1922
Penner, Lawrence R., Department of Zoology, University of Connecticut, Storrs, Connecticut 1940
*Peters, Harold Seymore, R. 1, Box 171, Charleston, South Carolina 1936
*Peters, Alfred, Box 201, Brandt, South Dakota 1931
Peterson, Mrs. Charles Emil, Madison, Minnesota 1936
Peterson, Liven A[dam], Jr., 904 S. 4th Ave., Virginia, Minnesota 1940
*Peterson, Roger Tory, 1006 Fifth Ave., New York City 1942
Peterson, Mrs. Theodore, 80 Oaklawn Ave., Battle Creek, Michigan....1941
Petrides, George Athan, 1333 Fairmont St., N.W., Washington, D.C....1942
*Pettingill, Dr. Olin Sewall, Jr., Department of Zoology, Carleton College, Northfield, Minnesota 1930
**Phelps, William H[enry], Apartado 2009, Caracas, Venezuela 1940
**Philipp, Frederick B., 152 Main St., Eatontown, New Jersey 1940
*Phillips, Alan Robert, 113 Olive Rd., Tucson, Arizona 1934
*Pickwell, Dr. Gayle Benjamin, San Jose State Teachers College, San Jose, California 1923
*Pierce, Robert Allen, Nashua, Iowa 1941
*Pirnie, Dr. Miles David, W. K. Kellogg Bird Sanctuary, Michigan State College, Augusta, Michigan 1928
Pitelka, Frank Alois, Museum of Vertebrate Zoology, University of California, Berkeley, California 1938
Plath, Karl, 2847 Giddings St., Chicago, Illinois 1942
Plattes, Cyril William, 392 Woodlawn Ave., St. Paul, Minnesota 1940
Playman, Mrs. H. L., 217 N. Union St., Appleton, Wisconsin 1941
Poncy, Robert, Rue Lachenal, 19, Geneva, Switzerland 1939
**Poole, Cecil A., 830 Chapman St., San Jose, California 1942
*Poor, Hustace Hubbard, 112 Park Ave., Yonkers, New York 1935
Porter, Miss Helen, 1440 S. 80th St., West Allis, Wisconsin 1942
Porter, Thomas Wayne, 307 S. Lansing St., Mt. Pleasant, Michigan 1938
*Potter, Julian Kent, 437 Park Ave., Collingswood, New Jersey 1915
Pough, Miss Marian F., 4 Lenox Place, St. Louis, Missouri 1942
*Pough, Richard Hooper, 33 Highbrook Ave., Pelham, New York 1938
Prather, Millard F[illmore], 912 McMillan Ave., W.E., Apt. H, Birmingham, Alabama 1940
*Preble, Edward Alexander, 3027 Newark St., Washington, D.C. 1929
*Presnall, Mrs. Clifford Charles, 5315 Earlston Dr., Washington, D.C. 1930
*Prill, Dr. Albert G., Main St., Scio, Oregon 1933
**Procter, William, Bar Harbor, Maine 1937
*Pueschel, Paul, 520 Drexel Ave., Glencoe, Illinois 1939
Putnam, Loren Smith, Stone Laboratory, Put-in-Bay, Ohio 1942
Quay, Thomas L[arelle], Department of Zoology, North Carolina State College, Raleigh, North Carolina 1939
*Quillian, Marvin C., Wesleyan College, Macon, Georgia 1927
Quimby, Don C., 4742 Garfield Ave., S., Minneapolis, Minnesota....1942
Ragusin, Anthony Vincent, Box 496, Biloxi, Mississippi 1937
Rahe, Carl W., 4666 Turney Rd., Cleveland, Ohio 1931
Ramon, Aveledo H., San Vincente a Callejon Mercedes No. 13, Caracas, Venezuela 1942

Ramsden, Dr. Charles Theodore, 8 & 19, Vista Alegre, Santiago de Cuba, Cuba 1914
Rapp, William F[rederick], Jr., 130 Washington Ave., Chatham, New Jersey 1941
Read, J. Spencer, 366 Union St., Springfield, Massachusetts 1942
*Rebmann, G. Ruhland, Jr., 7007 Hampden Lane, Edgemoor, Bethesda, Maryland 1941
Reed, Mrs. Carlos Isaac, 448 S. Villa Ave., Oak Park, Illinois 1937
Reed, Miss Willie Ruth, R. 1, Greenville, Tennessee 1939
*Reeder, Miss Clara Maude, 1608 College Ave., Houghton, Michigan.... 1938
*Reese, Mrs. Hans H., Circle Close, Shorewood Hills, Madison, Wisconsin. 1941
Rett, Egmont Z[achary], Museum of Natural History, Santa Barbara, California 1940
Rice, Mrs. Harry Wilson, 3940 Richfield Rd., Minneapolis, Minnesota... 1940
Rich, Dr. Guy C., 1820 El Cerrito Place, Hollywood, California 1914
Richards, Tudor, Joy's Lane, Groton, Massachusetts 1941
*Richey, Miss Leila Geraldine, Diamond, Pennsylvania 1942
*Ricks, Jesse J., 30 E. 42nd St., New York City 1931
Riner, Miss Alice, 503 S. Millwood, Wichita, Kansas 1939
**Rix, Malcolm W., 1087 Waverly Place, Schenectady, New York 1942
*Roads, Miss Myra Katie, 463 Vine St., Hillsboro, Ohio 1914
Robbins, Chandler S[eymour], Box 67, Ashburnham, Massachusetts 1941
Robbins, Samuel Dowse, Jr., 422 N. Murray St., Madison, Wisconsin.... 1941
**Roberts, Dr. Thomas Sadler, Museum of Natural History, University of Minnesota, Minneapolis, Minnesota 1914
Robertson, William Beckwith, Jr., Box 85, Berlin, Illinois 1942
***Rogers, Charles Henry, Princeton Museum of Zoology, Princeton, New Jersey 1903
Rogers, H. C., Glasgow, Kentucky 1941
Rogers, Irl, 402 Alturas Ave., Modesto, California 1937
*Rogers, Mrs. Walter E., Box 385, Appleton, Wisconsin 1931
Rollings, Clair Thomas, Division of Game Research, 319 Commerce Bldg., St. Paul, Minnesota 1940
*Rollo, Mrs. W. E., Otis Rd., Barrington, Illinois 1942
Root, Oscar M[itchell], Brooks School, North Andover, Massachusetts... 1940
Rorimer, Mrs. Irene Turk [Mrs. J. M.], Suite 415, 4707 Connecticut Ave., Washington, D.C. 1938
Rosene, Walter Melvin, 1210 Jupiter, Gadsden, Alabama 1923
*Rosewall, Dr. Oscar Waldemar, Department of Zoology, Louisiana State University, University, Louisiana 1931
Ross, C. Chandler, 7924 Lincoln Dr., Chestnut Hill, Philadelphia, Pennsylvania 1937
Rowan, Dr. William, University of Alberta, Edmonton, Alberta, Canada 1939
Rowland, Miss Caroline, 276 Chestnut Ave., N.E., Warren, Ohio 1942
Ruccker, Mrs. Otto, Seapowet Farm, Tiverton, Rhode Island 1941
Ruckman, Fred S., 2735 Oakwood Drive, Cuyahoga Falls, Ohio 1941
Rudd, R. L., 345 West St., Salinas, California 1939
Russell, Dr. Whitfield Leggett, Box 22, Rhome, Texas 1935
*Rust, Henry Judson, Box 683, Coeur d'Alene, Idaho 1921
*Rysgaard, George Nielson, Minnesota Museum of Natural History, University of Minnesota, Minneapolis, Minnesota 1937
*Satterthwait, Mrs. Elizabeth Allen, 806 W. Ohio St., Urbana, Illinois..... 1925
Saugstad, N[els] Stanley, 717 10th St., Bismarck, North Dakota 1939
*Saunders, Aretas Andrews, 361 Crestwood Rd., Fairfield, Connecticut.... 1934
*Saunders, Dr. George Bradford, Fish and Wildlife Service, 1623 N.W. Washington St., Brownsville, Texas 1926

*Saunders, William Edwin, 352 Clarence St., London, Ontario, Canada....1902
*Savage, James, Buffalo Athletic Club, Buffalo, New York 1939
Sawyer, Miss Dorothy, Unadilla, New York 1937
Saylor, Lawrence W[ebster], Fish and Wildlife Service, Washington, D.C..1940
*Schantz, William Edward, 1532 Aberdeen Ave., Columbus, Ohio 1938
Schaub, Mrs. Mary Hall, [Mrs. J. B.], 1040 Isabella St., Wilmette, Illinois.1939
Schlenker, Miss Lydia, 410 Floyd St., Toledo, Ohio 1937
*Schneider, Miss Evelyn, 2207 Alta Ave., Louisville, Kentucky.....1935
*Schorger, Dr. Arlie William, 168 N. Prospect Ave., Madison, Wisconsin...1927
Schroeder, Miss Clara, 479 W. Palmer St., Detroit, Michigan 1937
*Schuette, Chal, 1446 Beaver Rd., Sewickley, Pennsylvania 1942
Schultz, Miss Helen Homes, Box 105, Mary Washington College, Fredericksburg, Virginia 1929
Schutz, Miss Clara I[rene], 277 Park Place, Meadville, Pennsylvania....1941
Scotland, Dr. Minnie Brink, 42 Continental Ave., Cohoes, New York ...1938
Scott, David Maxwell, 3615 Prud'homme Ave., Apt. 11, Montreal, Quebec, Canada 1937
Scott, Thomas George, Department of Zoology, Science Bldg., Ames, Iowa 1936
Scott, Walter Edwin, Wisconsin Conservation Department, Madison, Wisconsin 1938
Sehl, Robert Henry, 7164 Uber St., Philadelphia, Pennsylvania 1942
Seibert, Henri, 204 Vivarium Bldg., University of Illinois, Champaign, Illinois 1941
Sellers, Miss Mary Hopkins, 1612 Noble Ave., Springfield, Illinois 1942
Serbousek, Miss Lillian, 1226 2nd St., S.W., Cedar Rapids, Iowa 1935
*Shaffer, Chester Monroe, Dorcas, West Virginia 1934
Sharp, Dr. Ward M., Valentine Lakes Waterfowl Refuge, Valentine, Nebraska 1936
Sharritt, Mrs. Grace V[ivian], 13533 Roselawn Ave., Detroit, Michigan..1941
Shaver, Jess M., George Peabody College for Teachers, Nashville, Tennessee 1922
Shaw, Dr. Charles H[icks], Bremen, Ohio 1941
**Shearer, Dr. Amon Robert, Mont Belvieu, Chambers Co., Texas 1893
*Shelar, Keller, State Teachers College, Slippery Rock, Pennsylvania 1940
*Shelford, Dr. Victor Ernest, Vivarium Bldg., University of Illinois, Champaign, Illinois 1931
Shepherst, J. Max, 504 River Rd., Maumee, Ohio 1941
Sheppard, Roy Watson, 1805 Mouland Ave., Niagara Falls, Ontario, Canada 1933
****Sherman, Miss Althea Rosina, National, via McGregor, Iowa 1902
Sherwood, John Willits, R. 2, Box 150, Salinas, California 1936
Shirling, Prof. Albert Elwood, 3849 E. 62nd St., Kansas City, Missouri ..1941
Short, [Hubert] Wayne, 1207 N. 7th St., St. Louis, Missouri 1941
Shortt, A. H., 762 Garfield St., Winnipeg, Manitoba, Canada 1942
Shortt, Terence Michael, Royal Ontario Museum of Zoology, Toronto, Ontario, Canada 1941
Sibley, Charles G., 2939 Dwight Way, Berkeley, California 1942
*Silliman, Oscar Perry, 225 W. Alesas St., Salinas, California 1939
Sime, P. R., 2427 26th St., Lubbock, Texas 1939
***Simmons, Edward McIlhenny, Avery Island, Louisiana 1942
Sims, Harold L., 714 St. Philip St., Thibodaux, Louisiana 1942
Skaggs, Merit Bryan, Julian Rd., South Euclid, Ohio 1934
Slack, Miss Mabel, 1004 Everett Ave., Louisville, Kentucky 1934
Slagle, Elmer Charles, 115 Court House, Duluth, Minnesota 1941
Slawson, Miss Celeste, Johnson Public Library, Hackensack, New Jersey..1942

Slipp, John W., Botany Department, University of Washington, Seattle, Washington 1942
*Smith, Dr. Arthur Francis, Manning, Iowa 1934
*Smith, Prof. Frank R, R. 2, Box 100, Laurel, Maryland 1910
Smith, Miss Gwendolyn B., 3920 Texas St., San Diego, California 1942
*Smith, Harry Madison, Whitman Laboratory of Experimental Zoology, University of Chicago, Chicago, Illinois 1936
Smith, J. Donald, White Bear Lake, Minnesota 1939
*Smith, Lewis MacCuen, 8040 St. Martins Lane, Chestnut Hill, Philadelphia, Pennsylvania 1931
Smith, Luther Ely, 1554 Telephone Bldg., 1010 Pine St., St. Louis, Missouri 1941
Smith, Orion O., 1539 Crosby St., Rockford, Illinois 1936
Smith, Philip E., 604 S. 6th St., Champaign, Illinois 1942
*Smith, Roy Harmon, 183 N. Prospect St., Kent, Ohio 1936
Smith, Thomas [Price], Osage Ave., Anchorage, Kentucky 1941
Smith, Wendell Phillips, Wells River, Vermont 1921
Snapp, Mrs. Edith, 310 W. Michigan, Urbana, Illinois 1940
Snyder, Lester Lynne, Royal Ontario Museum of Zoology, Toronto 5, Ontario, Canada 1929
Snyder, Richard Craine, 431 Clark St., South Orange, New Jersey 1940
Sooter, Clarence Andrew, Malheur National Wildlife Refuge, Burns, Oregon 1940
Soper, J[oseph] Dewey, 827 Riverwood Ave., Fort Garry, Winnipeg, Manitoba, Canada 1937
Spangler, Miss Iva M., 128 E. Foster Parkway, Fort Wayne, Indiana 1939
Spawn, Gerald B., South Dakota State College, Brookings, South Dakota. 1941
Spear, Ivan MacDonald, 39 West Elm St., Yarmouth, Maine 1942
*Speirs, Mrs. Doris Hustis, Ancaster, Ontario, Canada 1936
Speirs, John Murray, Ancaster, Ontario, Canada 1931
Spencer, Miss O. Ruth, 1030 25 Avenue Court, Moline, Illinois 1938
Sperry, Charles Carlisle, 1455 S. Franklin St., Denver, Colorado 1931
Spofford, Walter Richardson II, Vanderbilt University Medical School, Nashville, Tennessee 1942
Stabler, Robert M[iller], Glen Mills, Pennsylvania 1939
Stacey, J[ohn] W[illiam], 236 Flood Bldg., San Francisco, California ..1940
Stackpole, Richard, 292 Beacon St., Boston, Massachusetts 1940
Staebler, Arthur Eugene, R. 5, Box 252, Ann Arbor, Michigan 1937
**Stahl, Miss Marjoretta Jean, Kimberly, West Virginia 1942
Stanford, Jack A[rchibald], 1900 North Circle Dr., Jefferson City, Missouri 1941
Stanley, Allan J., Louisiana State University, University, Louisiana 1941
Stark, Miss Wilma R[uth], 1701 16th St., N.W., Washington, D. C. 1939
Starrett, William Charles, 5432 N. Campbell Ave., Chicago, Illinois 1933
*Stebbins, Miss Fannie Adell, 31 Ely Ave., West Springfield, Massachusetts 1935
Steggerda, Dr. Morris, Department of Genetics, Carnegie Institution of Washington, Cold Spring Harbor, Long Island, New York 1941
Stephens, Dr. Thomas Calderwood, Morningside College, Sioux City, Iowa 1911
*Stevens, O. A., State College Station, Fargo, North Dakota....1926
Stevenson H[orace] Godwin, Jr., 7318 Bryan St., Mt. Airy, Philadelphia, Pennsylvania 1939
*Stewart, Paul Alva, Leetonia, Ohio 1925
Stewart, Robert Earl, Patuxent Research Refuge, Bowie, Maryland....1939
*Stickney, Mrs. Albert, Jr., 350 E. 52nd St., New York City....1935

*Stillwell, Jerry E., 7460 San Benito Way, R. 4, Dallas, Texas 1935
**Stoddard, Herbert Lee, R. 5, Sherwood Plantation, Thomasville, Georgia..1916
Stone, Harry H[erbert], Jr., Box 101, Sturbridge, Massachusetts 1941
*Stoner, Dr. Dayton, New York State Museum, Albany, New York 1912
Stophlet, John Jermain, 2612 Maplewood Ave., Toledo, Ohio 1934
Storer, John Humphreys, 579 Beaver St., Waltham, Massachusetts 1939
*Storer, Dr. Tracy Irwin, Division of Zoology, University of California, Davis, California 1928
Stoudt, Jerome H., 209 N. Mill St., Waupun, Wisconsin 1941
Street, Thomas M., Bottineau, North Dakota 1940
Strehlow, Elmer William, 721 W. Mason St., Green Bay, Wisconsin 1941
Stringham, Dr. Emerson, Box 94, Madison, Wisconsin 1940
****Strong, Dr. Reuben Myron, 5840 Stoney Island Ave., Chicago, Illinois .....Founder
Struck, Dr. Kuno Herbert, 1003 First National Bank Bldg., Davenport, Iowa 1942
Stullken, Donald Edward, 5464 W. Walton St., Chicago, Illinois 1941
***Sturgeon, Myron T., Michigan State Normal College, Ypsilanti, Michigan.1934
Sturgis, S. Warren, 66 Marlboro St., Boston, Massachusetts 1941
*Sumner, Eustace Lowell, Sr., 2537 Rose Walk, Berkeley, California.....1931
*Suthard, James Gregory, 1881 Raymond Ave., Long Beach, California....1936
**Sutton, Dr. George Miksch, Laboratory of Ornithology, Fernow Hall, Cornell University, Ithaca, New York 1920
*Swanson, Dr. Gustav [Adolph], Division of Economic Zoology, University of Minnesota, University Farm, St. Paul, Minnesota 1927
*Swedenborg, Ernie David, 4905 Vincent Ave., S., Minneapolis, Minnesota.1929
Tabor, Miss Ava Rogers, 305 Canal Blvd., Thibodaux, Louisiana 1940
Tallman, William S[weet], Jr., 4 Linden Place, Sewickley, Pennsylvania..1940
Tanner, James T., 16½ N. Church St., Cortland, New York.....1937
*Taverner, Percy Algernon, 45 Leonard Ave., Ottawa, Ontario, Canada...1905
*Taylor, Dr. Aravilla Meek, Lake Erie College, Painesville, Ohio 1936
***Taylor, Dr. Arthur Chandler, Irving Zuelke Bldg., Appleton, Wisconsin..1929
Taylor, Miss Joanne, 1176 Shattuck, Berkeley, California 1941
***Taylor, Mrs. Rose Schuster, 900 Santa Barbara Rd., Berkeley, California.1916
*Taylor, Walter Penn, 254 Faculty Exchange, College Station, Texas.....1937
Taylor, William Ralph, Museum of Vertebrate Paleontology, University of Kansas, Lawrence, Kansas 1940
*Teachenor, Dix, 1020 W. 61st St., Kansas City, Missouri 1923
Temple, Mrs. Edward H., Box 118, North Woodstock, New Hampshire..1942
Terres, J[ohn] Kenneth, 103 E. Third St., Watkins Glen, New York....1939
Thatcher, S. Charles, 2918 Brownsboro Rd., Louisville, Kentucky 1942
*Thacker, Miss Maxine, Branchland, West Virginia 1941
*Thomas, Edward Sinclair, 319 Acton Rd., Columbus, Ohio 1921
*Thomas, Judge Otho S., 205 S. Greene St., Rock Rapids, Iowa 1932
*Thomas, Mrs. Rowland, R. 3, North Little Rock, Arkansas 1937
*Thornton, William James, Box 1011, Birmingham, Alabama 1940
***Thorp, George Boulton, Scattergood Hostel, West Branch, Iowa 1935
*Tinker, Almerin David, R. 1, Chelsea, Michigan 1909
Tipton, Dr. Samuel R[idley], 212 Marlborough St., Detroit, Michigan....1941
Todd, Mrs. Elizabeth D., 918 W. Main St., Kalamazoo, Michigan.....1939
Todd, Henry Oliver, Jr., Woodbury Rd., Murfreesboro, Tennessee.....1938
**Todd, W[alter] E[dmond] Clyde, Carnegie Museum, Pittsburgh, Pennsylvania 1911
*Tomkins, Ivan Rexford, U. S. Dredge Morgan, Savannah, Georgia.....1931
Toner, George C., 63 Lowther Ave., Toronto, Ontario, Canada 1939
Tonkin, George, 1140 Park Square Bldg., Boston, Massachusetts 1935

*Trautman, Milton Bernhard, Stone Laboratory, Put-in-Bay, Ohio 1932
Travis, Bernard V., Box 655, New Smyrna Beach, Florida 1935
Tryon, Clarence Archer, Jr., Zoology Department, Montana State College, Bozeman, Montana 1942
*Tubbs, Farley F., Game Division, Department of Conservation, Lansing, Michigan 1935
***Tucker, Mrs. Carll, Penwood, Mount Kisco, New York 1928
Tucker, Edward R., 245 N. Auburndale, Memphis, Tennessee 1942
*Turner, Miss Ruth D[ixon], 163 Forest St., Melrose, Massachusetts.....1939
Tuttle, George Mott, Jr., River Rd., Youngstown, New York 1940
Tvedt, Harold B[loom], 60 Chittenden, Columbus, Ohio 1941
*Twomey, Dr. Arthur Cornelius, Carnegie Museum, Pittsburgh, Pennsylvania 1936
*Tyler, Dr. Winsor Marrett, 1482 Commonwealth Ave., Brighton, Massachusetts 1914
*Uhler, Francis Morey, Patuxent Research Refuge, Bowie, Maryland 1931
**Uhrig, Mrs. A. B., Box 28, Oconomowoc, Wisconsin 1926
Umbach, Miss Margaret, 2526 East Dr., Fort Wayne, Indiana 1941
Uttal, Leonard Jordan, 225 S. Western, Enid, Oklahoma 1940
*Vaiden, Meredith Gordon, Rosedale, Mississippi 1937
Van Coevering, Jack, 9816 Ingram-Rosedale Gardens, Plymouth, Michigan 1939
**Vandervort, Charles Champion, Laceyville, Pennsylvania 1937
Vaniman, Mrs. Vernon, 408 W. Iowa St., Urbana, Illinois 1941
*Van Rossem, A. J., 2205 West Adams St., Los Angeles, California.....1939
**Van Tyne, Mrs. C. H., 484 Gordon Rd., Ridgewood, New Jersey.....1939
***Van Tyne, Dr. Josselyn, Museum of Zoology, Ann Arbor, Michigan....1922
Vaughan, William Coleman, 213 Raymond St., Chevy Chase, Maryland...1938
Velich, Ralph W., Nebraska State Museum, University of Nebraska, Lincoln, Nebraska 1941
Vesall, David Bernard, Stillwater, Minnesota 1940
*Visscher, Dr. Paul, Biology Laboratory, Western Reserve University, Cleveland, Ohio 1924
*Vogt, William, % Mrs. F. V. Brown, 32 Cunningham Ave., Floral Park, New York 1935
*Vollmar, Mrs. Joseph E., 6138 Simpson Ave., St. Louis, Missouri 1941
von Bloeker, Jack C[hristian], Jr., 1625 Country Club Drive, Glendale, California 1940
Wade, Douglas E., Department of Zoology, University of Missouri, Columbia, Missouri 1936
Wagner, Esther E., 13 Locust Ave., Danbury, Connecticut 1937
*Wagner, Fritz, Jr., 384 Hawthorne Lane, Winnetka, Illinois 1938
*Walker, Dr. Charles Frederic, Stone Laboratory, Put-in-Bay, Ohio.....1939
*Walkinshaw, Dr. Lawrence Harvey, 1416½ W. Michigan Ave., Battle Creek, Michigan 1928
Wallace, George John, Zoology Department, Michigan State College, East Lansing, Michigan 1937
Wallace, Harold Eugene, 401 N. Trenton St., Ruston, Louisiana 1942
Wallner, Alfred, 111 Roby Rd., Madison, Wisconsin 1941
Wanless, Dr. Harold R[ollin], 704 S. McCullough St., Urbana, Illinois..1940
Warner, Mrs. Carmen Hambleton, 117 W. Hubbard Ave., Columbus, Ohio.1939
Watson, Frank Graham, 2418 Chestnut Ave., Long Beach, California....1937
Watson, Lucius H., 4013 Sheridan Blvd., Lincoln, Nebraska 1925
*Weaver, Dr. Richard Lee, University of New Hampshire, Durham, New Hampshire 1936
Weber, Edmund P., 95 Ingram Ave., Pgh. No. 5, Ingram, Pennsylvania...1942

Weber, Louis, M[arkus], 2713 Dodier St., St. Louis, Missouri 1941
*Weber, Orlando Franklin, Jr., Mt. Kisco, New York 1936
Webster, J[ackson] Dan, Biology Department, Rice Institute, Houston, Texas 1939
Weingart, Vernon Rolland, R. 1, Kent, Ohio 1942
Welles, Mrs. Mary Pyke, R. 2, Ossining, New York 1938
Wessel, John P., Wright City Junior College, 3400 Austin Ave., Chicago, Illinois 1941
West, Russell, 113 Edgewood St., Wheeling, West Virginia 1941
*Wester, Russell William, 112 Prospect St., Nutley, New Jersey 1942
*Wetmore, Dr. Alexander, U.S. National Museum, Washington, D.C.....1903
*Weydemeyer, Winton, Fortine, Montana 1930
*Weyl, Edward Stern, 6506 Lincoln Dr., Mt. Airy, Philadelphia, Pennsylvania 1927
**Wheatland, Miss Sarah Bigelow, Concord Academy, Concord, Massachusetts 1942
White, Courtland Y., 1118 Spruce St., Philadelphia, Pennsylvania 1942
*White, Francis Beach, Silk Farm Rd., R. 2, Concord, New Hampshire.. 1926
**White, Miss Katherine A[ugusta], R. 2, Collinsville, Illinois 1940
White, Miss Laura C., 806 Strand, Redondo Beach, California 1942
Whitney, Nathaniel Ruggles, Jr., Lowell M-33, Cambridge, Massachusetts.1942
Widmann, Berthold, 4621 Wesley Ave., Los Angeles, California 1936
*Wiggin, Henry Taylor, 151 Tappan St., Brookline, Massachusetts 1941
Wilcox, Harry Hammond, Jr., Madison Court, Ann Arbor, Michigan.....1938
Wiles, D. Harold O[liver], 1407 Gilpin Ave., Wilmington, Delaware.....1936
*Williams, Laidlaw Onderdonk, Box 453, Carmel, California.....1930
*Wilson, Archie F., 1322 Braeburn Rd., Flossmoor, Illinois 1937
Wilson, Mrs. Carl, 6208 Yinger St., Dearborn, Michigan 1941
*Wilson, Dr. Gordon, 1434 Chestnut St., Bowling Green, Kentucky 1925
Wilson, Harold Charles, Ephraim, Wisconsin 1938
Wilson, Mrs. Myrtha M., R. 3, Raleigh, North Carolina 1942
Wilson, Rowland Steele, 5274 Riverside Dr., Columbus, Ohio 1941
Wiltshire, Mrs. Grace T., Randolph-Macon Woman's College, Lynchburg, Virginia 1941
**Wineman, Andrew, 150 Michigan Ave., Detroit, Michigan 1934
Wing, Harold F., R. 3, Jackson, Michigan 1941
*Wing, Dr. Leonard William, Washington State College, Pullman, Washington 1924
Winterbottom, J[ohn] M[iall], African Education Office, Mazabuka, Northern Rhodesia 1939
*Witschi, Dr. Emil, Department of Zoology, University of Iowa, Iowa City, Iowa 1935
Witt, Miss Elizabeth B., Hunt Apts., Greensburg, Pennsylvania 1942
*Wood, Dr. Harold Bacon, 3016 N. Second St., Harrisburg, Pennsylvania.1932
*Wood, Norman Asa, Museum of Zoology, University of Michigan, Ann Arbor, Michigan 1925
Woodward, Arthur Jason, 504 Kahkwa Blvd., Erie, Pennsylvania 1937
*Woolman, Edward, Panmure Ave., Haverford, Pennsylvania 1928
Worley, John G., 237 Charleston St., Cadiz, Ohio 1936
*Worth, Dr. C[harles] Brooke, Department of Zoology, Swarthmore College, Swarthmore, Pennsylvania 1938
Wright, Miss Audrey Adele, 1312 Hepburn St., Louisville, Kentucky 1941
Wright, Ernest Bicknell, 140 W. Chestnut Ave., Chestnut Hill, Philadelphia, Pennsylvania 1941
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